

Report on the Consultative Committee for Photometry  
and Radiometry Key Comparison of Regular Spectral  
Transmittance 2010 (CCPR-K6.2010)

February 2017

Final Report

Annette Koo

## Contents

Introduction.....	3
Artefact Preparation and Selection.....	4
Comparison Measurements.....	6
Participant Facilities.....	6
Pre-Draft A Process.....	7
Analysis Method.....	7
Global Consistency.....	10
Results.....	11
Linking to this Comparison.....	27
Conclusion.....	27
Effect of Extra Pilot Measurements.....	28
Effect of Cut-off.....	28
Acknowledgements.....	29
References.....	29
List of Appendices.....	30
Appendix I – Reported Values from all Participants	
Appendix L – Weights used to Find Solution	
Appendix M – Covariances Required for RMO Comparisons	

## Introduction

In order to assist National Metrology Institutes to fulfil their obligations under the Mutual Recognition Arrangement (MRA), the Consultative Committee for Photometry and Radiometry (CCPR) facilitates measurement comparisons of several 'key' measurement scales. At present there are a total of six separate photometry and radiometry scales and a full set of such comparisons were carried out between 1999 and 2005.

The first round of CCPR comparisons since the signing of the MRA were intended not only to establish the equivalence of measurement scales realised in different laboratories around the world, but also to test the technical implementation of the MRA. Along with key comparisons carried out by other consultative committees during this period, each comparison generated a great deal of thinking and discussion to address not only technical issues such as statistical models, data analysis, missing data, unstable artefacts and inconsistency of results, but also the very meaning of a comparison and the intent of the MRA. This round of comparisons created precedents – both in their interpretation of the MRA and in the establishment of protocols for each comparison quantity.

Despite the ongoing discussion, most of the comparisons were successful in showing equivalence and providing evidence to support the Calibration and Measurement Capabilities (CMC) recorded in the BIPM database. In addition, member states of Regional Metrology Organisations were able to claim CMCs through participation in regional comparisons linked to the CCPR comparisons.

At the 2007 meeting of the CCPR, it was decided that regular spectral transmittance should be the first comparison planned for the second round of CCPR comparisons. The Measurement Standards Laboratory of NZ (MSL) was chosen as the pilot at the 2008 meeting of the CCPR WG-KC and applications to participate were invited. Twelve participants were assembled, representing each of the RMOs. The participant institutes along with the primary contacts are given below.

### APMP:

Agency for Science, Technology and Research (A\*STAR), Singapore, Liu Yuanjie  
Korea Research Institute of Standards and Science (KRISS), Korea, Jisoo Hwang  
National Metrology Institute of Japan (NMIJ), Japan, Hiroshi Shitomi  
Measurement Standards Laboratory (MSL), New Zealand, Annette Koo

### SIM:

National Research Council of Canada (NRC), Canada, Joanne Zwinkels  
National Institute of Standards and Technology (NIST), USA, Catherine Cooksey

### AFRIMETS:

National Metrology Institute of South Africa (NMISA), South Africa, Natasha Nel-Sakharova,  
Irma Kruger

### EURAMET:

Laboratoire Commun de Métrologie (LNE-CNAM), France, Gael Obein  
Hungarian Trade Licensing Office (MKEH), Hungary, George, Andor, Peter Gal  
National Physical Laboratory (NPL), United Kingdom, Andrew Deadman, Teresa Goodman  
Physikalisch-Technische Bundesanstalt (PTB), Germany, Alfred Schirmacher

### COOMET:

All-Russian Research Institute for Optical and Physical Measurements (VNIIOFI), Russia,  
Svetlana Morozova

LNE-CNAM, NPL, NIST, VNIIOFI and PTB were selected to make up the task group to assist MSL with drafting the protocol and making decisions.

Selection of filter characteristics and conditions for measurement were chosen with reference to feedback from the first K6 comparison.

Although spectral transmittance is conceptually the simplest of the six CCPR comparison quantities, the results during the first K6 comparison had been disappointing due to unexpectedly large instability in the artefacts. This meant that the uncertainties in the final reported degrees of equivalence were dominated by the instability of the artefacts and the comparison did not result in a robust test of the participants' scales.

Despite these problems, it was determined that Schott glass was still the most well-known and reliable type of artefact for the second K6 comparison.

A comment from the previous comparison regarding the unsuitability of the filters at wavelengths shorter than 400 nm due to strong spectral shape was also taken into consideration. The conclusion was that since NMIs will always have to make measurements at wavelengths shorter than 400 nm, where suitable calibration filters are not always available, and although uncertainties will be higher due to the slope in the transmittance of the filters, including this wavelength is a good test of measurement capability. In addition, it has been noted by the CCPR-KC that in order for the new K6 comparison to retain the same comparison identifier, parameters such as the wavelength range should perhaps not be changed [1, p. 15].

A technical protocol very similar to that of the first K6 comparison was drafted and submitted to the CCPR-WG-KC and registered with the KCDB on 20 June 2010 (see Appendix A).

## **Artefact Preparation and Selection**

Owing to the difficulties with artefact stability in the first K6 comparison [2], it was imperative that the stability of the artefacts be established before the measurements commenced. MSL undertook to fabricate artefacts of excellent optical quality and to monitor them for changes in transmittance for at least six months before starting the comparison.

Glass blanks of types BK7, NG11, NG5, NG4 and NG3 were purchased from Schott (Malaysia) in August 2009 and polishing of the glass was carried out by the optics workshop at Industrial Research Limited in New Zealand (now Callaghan Innovation). Measurements of spectral transmittance on the polished glass showed that the NG11 glass was not all from the same melt, and the NG5 glass blanks were not even all NG5. The blanks were replaced by Schott and polished again. By June 2010 a full set of filters had been manufactured to the  $< 3 \mu\text{m}$  wedge specified in the protocol and assessed for uniformity.

The filters were then cleaned, and measurements of regular transmittance were begun on four sets of filters. Assessments of dependence of transmittance on polarization, temperature, orientation of filters and displacement of filters were carried out on four test sets. A strong temperature dependence of transmittance was quickly noted and investigated. Stability checks were conducted regularly.

It was clear by June of 2011 that the filters were not stable to the level required for a comparison, so MSL requested a set of filters from the first CCPR K6 comparison from LNE-CNAM. Set 19 was received and measurements begun without any cleaning of the filters. The temperature dependence of these filters was also investigated and temperature coefficients were found to be very similar to the new MSL filters. The result of temperature and stability testing of all filters was reported at NewRad 2011 and published [3]. The nominal transmittances of the filters at the chosen comparison wavelengths are shown in figure 1.

Regular measurements of transmittance of all of the new MSL filters, as well as the single set from the first K6 comparison, were continued until mid-2012. As the new MSL filters still did not show sufficient stability, the task group decided to add four more filter sets from the first K6 comparison to be monitored for another 6 months: two sets to be cleaned using methanol and lens tissue, and two sets to be measured 'as is'. After this period, it was clear that the 'old' filters exhibited superior stability to the 'new' filters (regardless of cleaning) and it was decided to proceed with the comparison using these. See Appendix B.

An additional 24 sets of filters from the first K6 comparison were sent to MSL in the middle of 2013, making a total of 29 sets. Set 19 was retained for ongoing stability checks, and the remaining 28 sets were cleaned, assessed for wedge by measurements of thickness at the corners, and the 'best' 15 filters of each type were assembled into new sets, with new containers (see figure 2) for the comparison. Round 1 of measurements began at the end of June 2013.

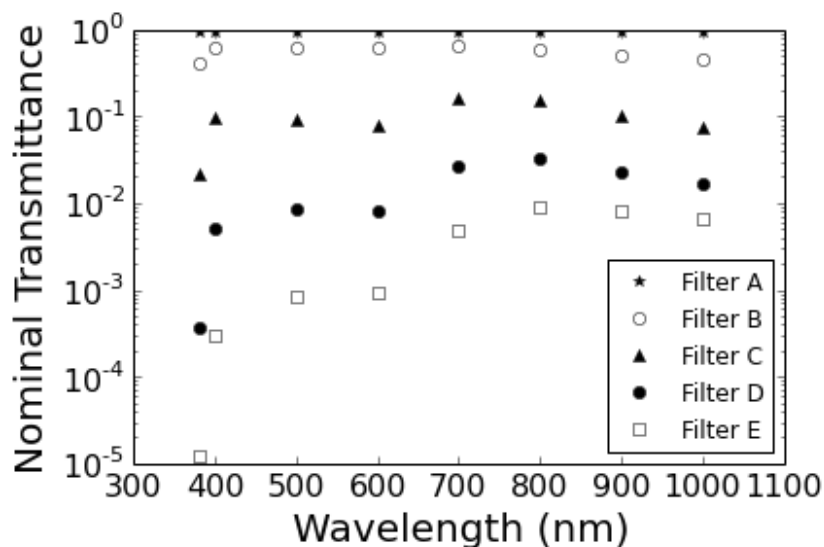


Figure 1. Nominal transmittance of the artefacts for CCPR-K6.2010.

The participants were provided with the temperature coefficients determined by the pilot (see Appendix C). These were to be used at the discretion of each participant.

In order for the filters to be used again, with a low risk of the results of this comparison being referred to by participants of the regional comparisons, the serial numbers of filters used will not be published in this report.



Figure 2. Anodized Aluminium/Teflon containers for transportation and storage of filters.

## Comparison Measurements

The measurements for the comparison were carried out as follows:

27 Jun to 10 Oct 2013	Round 1 measurements by pilot.
Oct 2013	Filters couriered to all participants for round 2 measurements.
10 Jan to 25 Mar 2014	Filters arrive back from participants – filters were examined by pilot for contamination. In several cases, some contamination was observed as well as a distinct change in transmittance. In these cases, agreement was sought and obtained from the relevant participants to clean the filters using methanol and lens tissue. This was carried out for a total of 9 filters.
10 Feb to 14 Apr 2014	Round 3 measurements by pilot (one filter set was only measured twice instead of three times during this round due to late return to pilot).
Apr 2014	Filters couriered to all participants for round 4 measurements.
4 Jun to 11 Sept 2014	Filters arrive back from all participants except one.
12 Sept to 12 Nov 2014	Round 5 measurements by pilot (one filter set was not measured at all due to return after all other measurements were completed).

## Participant Facilities

All participants provided descriptions of their facilities and these are included with the participant reports in Appendix D.

## Pre-Draft A Process

On 2 February 2015 all of the pre-Draft A documents were made available to the participants. Tables of reported values by each participant were sent to that participant only. Full uncertainty tables and relative data for all of the comparison measurements were made available to all participants. At this stage, participants were also asked to examine the internal consistency of their own results using a simple 95 % significance test (see Appendix E).

As a result of the pre-Draft A process, several laboratories made changes to their results. A summary of all the changes submitted by the participants is given in Appendix F.

No comments on uncertainty budgets were received.

The final uncertainty tables of all participants can be found in Appendix G.

The relative data for all participants can be found in Appendix H.

The final reported data for all participants can be found in Appendix I.

## Analysis Method

In order to carry out the next step of the pre-draft A process, namely to check global data consistency, it was necessary to find the values of the degrees of equivalence for each participant at each comparison point. To do so requires a model for the measurements, including the degrees of equivalence. In the CCPR, two models have previously been used. The first, which will be called “Model A”, has not been stated explicitly but can be inferred to be (see e.g. part 6 of Appendix B to [4]) :

$$y_{i,f,r} = T_f + \varepsilon_{i,f,r} \quad (1a)$$

$$\Delta_i = T_f - \overline{y_{i,f,r}} \quad (1b)$$

where  $y_{i,f,r}$  is the measurement result of the  $r$ th round given by participant  $i$  of filter  $f$  and  $\overline{y_{i,f,r}}$  is an average of those results,  $T_f$  is the true transmittance value of the filter,  $\varepsilon_{i,f,r}$  is the random error of the measurement and  $\Delta_i$  is the unknown bias of participant  $i$ . The degree of equivalence (DoE) is interpreted to be the quantity  $\Delta_i$ . The second model, nominated “Model B”, is:

$$y_{i,f,r} = T_f + \Delta_i + \varepsilon_{i,f,r} \quad (2)$$

In order for these models to deliver a unique solution, a constraint must be applied. The constraint mandated by the CCPR guidelines is

$$\sum_i w_i \Delta_i = 0. \quad (3)$$

The  $w_i$  are the weights for each participant and are determined as

$$w_i = \frac{u_c^{-2}(t_i)}{\sum_j u_c^{-2}(t_j)} \quad (4)$$

where the  $u_c(t_i)$  are calculated as follows in compliance with CCPR-G2 Section 5.3.1 [4]: the averages of the combined standard uncertainties given by each participant for all measurements are calculated, and the median of these values determined. A cut-off is then found as the average of the uncertainty values of those participants that reported uncertainties smaller than or equal to the median. The value  $u_c(t_i)$  for each participant is the larger of the cut-off and their average uncertainty.

If the averaging of the measurement results  $y$  in equation (1b) is a weighted average of the participant's measurements and takes into account any correlations between measurements, then both Model A and Model B give the same results for the degrees of equivalence, the uncertainty in the degrees of equivalence and the transmittance values of the filters. (The difference between the models comes when a global consistency check is applied – this is discussed in the next section.)

To solve for the unknown degrees of equivalence and transmittance values, the following process was followed. Model B can be written in matrix notation as

$$\mathbf{y} = X\boldsymbol{\beta} + \mathbf{e}. \quad (5)$$

The vector  $\mathbf{y}$  contains all the measurement results:

$$\mathbf{y} = \begin{bmatrix} y_{1,1,2} \\ y_{1,1,4} \\ y_{2,2,2} \\ y_{2,2,4} \\ y_{3,3,2} \\ y_{3,3,4} \\ \vdots \\ y_{11,11,4} \\ y_{12,1,1} \\ y_{12,1,3} \\ y_{12,1,5} \\ y_{12,2,1} \\ y_{12,2,3} \\ y_{12,2,5} \\ \vdots \\ y_{12,11,3} \\ y_{12,11,5} \end{bmatrix},$$

where participant 12 is the pilot. The matrix  $X$  is a design matrix which represents the structure of the comparison. This matrix contains  $F + P$  columns, where  $F$  is the number of artefacts and  $P$  is the number of participants (degrees of equivalence). It contains  $M$  rows, where  $M$  is the total number of measurements. Each row relates to a single measurement, and contains all zeros except for a '1' in the two columns corresponding to the filter and participant for that measurement:



$$\begin{array}{c}
\begin{array}{cccc}
1 & 2 & \dots & 11 \\
\hline
\end{array} & \begin{array}{cccc}
1 & 2 & \dots & 11 & 12 \\
\hline
\end{array} \\
X = \begin{bmatrix}
1 & 0 & \dots & 0 & 1 & 0 & \dots & 0 & 0 \\
1 & 0 & \dots & 0 & 1 & 0 & \dots & 0 & 0 \\
0 & 1 & \dots & 0 & 0 & 1 & \dots & 0 & 0 \\
0 & 1 & \dots & 0 & 0 & 1 & \dots & 0 & 0 \\
\vdots & \vdots & \dots & \vdots & \vdots & \vdots & \dots & \vdots & \vdots \\
0 & 0 & \dots & 1 & 0 & 0 & \dots & 1 & 0 \\
0 & 0 & \dots & 1 & 0 & 0 & \dots & 1 & 0 \\
1 & 0 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
1 & 0 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
1 & 0 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
0 & 1 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
0 & 1 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
0 & 1 & \dots & 0 & 0 & 0 & \dots & 0 & 1 \\
\vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\
0 & 0 & 0 & 1 & 0 & 0 & 0 & \dots & 1 \\
0 & 0 & 0 & 1 & 0 & 0 & 0 & \dots & 1 \\
0 & 0 & 0 & 1 & 0 & 0 & 0 & \dots & 1
\end{bmatrix}
\end{array}
\left.
\begin{array}{l}
y_{1,1,2} \\
y_{1,1,4} \\
y_{2,2,2} \\
y_{2,2,4} \\
\vdots \\
y_{11,11,2} \\
y_{11,11,4} \\
y_{12,1,1} \\
y_{12,1,3} \\
y_{12,1,5} \\
y_{12,2,1} \\
y_{12,2,3} \\
y_{12,2,5} \\
\vdots \\
y_{12,11,1} \\
y_{12,11,3} \\
y_{12,11,5}
\end{array}
\right\}$$

The vector  $\beta$  is the vector of unknowns:

$$\beta = \begin{bmatrix}
T_1 \\
T_2 \\
\vdots \\
T_{11} \\
\Delta_1 \\
\Delta_2 \\
\vdots \\
\Delta_{11} \\
\Delta_{12}
\end{bmatrix}$$

and the vector  $e$  is the vector of errors, estimated to have value zero, with associated covariance matrix  $U$ :

$$U = \begin{bmatrix}
u^2(y_{1,1,2}) & u(y_{1,1,2}, y_{1,1,4}) & \dots & 0 & 0 \\
u(y_{1,1,2}, y_{1,1,4}) & u^2(y_{1,1,4}) & \dots & 0 & 0 \\
\vdots & \vdots & \ddots & \vdots & \vdots \\
0 & 0 & \dots & u^2(y_{12,11,3}) & u(y_{12,11,3}, y_{12,11,5}) \\
0 & 0 & \dots & u(y_{12,11,3}, y_{12,11,5}) & u^2(y_{12,11,5})
\end{bmatrix}$$

where  $u^2(y_{i,f,r})$  is the variance for the error of measurement  $y_{i,f,r}$  and  $u(y_{i,f,r}, y_{i,g,s})$  is the covariance of the errors in measurements  $y_{i,f,r}$  and  $y_{i,g,s}$ . Note that the block of the covariance matrix associated with pilot measurements will have nonzero components between measurements of different artefacts as well as between measurements of the same artefact.

The constraint (eq. (3)) can be included by assembling the following vector:

$$\mathbf{w} = \begin{bmatrix} 0 \\ 0 \\ \vdots \\ w_1 \\ w_2 \\ \vdots \\ w_{11} \\ w_{12} \end{bmatrix} \left. \begin{array}{l} \} F \text{ rows} \\ \} P \text{ rows} \end{array} \right\}$$

The least squares solution for  $\boldsymbol{\beta}$ ,  $\hat{\boldsymbol{\beta}}$ , can be found as (see reference [5] for equivalence of this approach with those of other authors):

$$\hat{\boldsymbol{\beta}} = (X'U^{-1}X + \mathbf{w}\mathbf{w}')^{-1}X'U^{-1}\mathbf{y} = \Gamma\mathbf{y}. \quad (6)$$

The covariance matrix of  $\hat{\boldsymbol{\beta}}$  is given as

$$\text{cov}(\hat{\boldsymbol{\beta}}) = \Gamma U \Gamma'. \quad (7)$$

The degrees of equivalence are then the values in the bottom half of  $\hat{\boldsymbol{\beta}}$  and the uncertainties of the degrees of equivalence are the square roots of the corresponding diagonal elements of  $\text{cov}(\hat{\boldsymbol{\beta}})$ .

## Global Consistency

The final step of pre-Draft A was to examine global consistency of the results with the model for the comparison. The first question indicated in the CCPR guidelines is to find whether any results show  $\frac{DoE}{U(DoE)} > 3$ , where  $U(DoE)$  is the expanded uncertainty with  $k = 2$ . This did not occur for any measurements in this comparison.

The second question is whether a chi squared ( $\chi^2$ ) test indicates the required level of probability of well distributed results. As mentioned in the previous section, this is the point at which the applications of the two available models A and B given in equations (1) and (2) diverge.

In general,  $\chi^2$  is calculated as the sum of the squares of the normalised residuals (described in more detail in Appendix J) and its calculation depends on the model for the measurement. The difference comes down to whether the bias  $\Delta_i$ , aka the degree of equivalence, is considered part of the residual (Model B) or not (Model A). More detail on the difference the two models make to the calculation of  $\chi^2$  is also given in Appendix J, which was sent to all participants at this stage of the pre-draft A process. In matrix notation the calculated values,  $\tilde{\chi}^2$ , for the two models can be given as:

$$\tilde{\chi}^2(\text{Model A}) = \hat{\boldsymbol{\beta}}' [\text{cov}(\hat{\boldsymbol{\beta}})]^{-1} \hat{\boldsymbol{\beta}} \quad (8a)$$

$$\tilde{\chi}^2(\text{Model B}) = (\mathbf{y} - X\hat{\boldsymbol{\beta}})' [\text{cov}(\hat{\boldsymbol{\beta}})]^{-1} (\mathbf{y} - X\hat{\boldsymbol{\beta}}) \quad (8b)$$

In order to aid the decision making process, the implications of choosing one model or the other were made explicit by carrying out the Mandel-Paule process mandated by the CCPR in cases where the data fail the  $\chi^2$  test. That is, whenever the value  $\tilde{\chi}^2$  calculated from the data was found to be

greater than  $\chi^2_{\nu}(p = 0.05)$ , for the appropriate degrees of freedom,  $\nu$ , an additional component of uncertainty was added to all measurements of all participants until  $\tilde{\chi}^2 = \chi^2_{\nu}(p = 0.05)$ , recalculating the weights as required. Appendix K shows the effect of the Mandel-Paule process on the number of participants that were found inequivalent by the metric  $\frac{DoE}{U(DoE)} > 1$  for both models. The participants decided at this point to wait for a final decision from the CCPR WG-KC as to which of the models should be used as a basis for consistency checking.

A meeting of the CCPR WG-KC was held in October 2015 in Beijing and the issue was addressed. Some further information was submitted to the WG-KC than is found in the appendices: namely, the effect of the application of the two different models on the estimated values of the artefacts. The usual argument for Model A is that it delivers better estimates of the artefact values. However, in this comparison, the effect on the artefact values of applying Mandel-Paule with Model A is almost negligible. Rather, the improved equivalence of participants is due primarily to the increase in uncertainty of their measurement. Of the 28 comparison points for which equivalence was achieved after Mandel-Paule using Model A, 27 points changed status due to increased uncertainty and only one point changed status due to change in the artefact value.

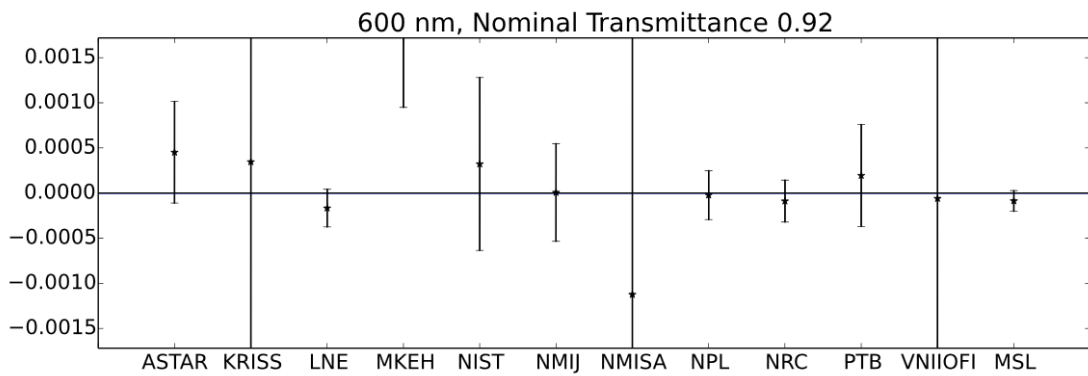
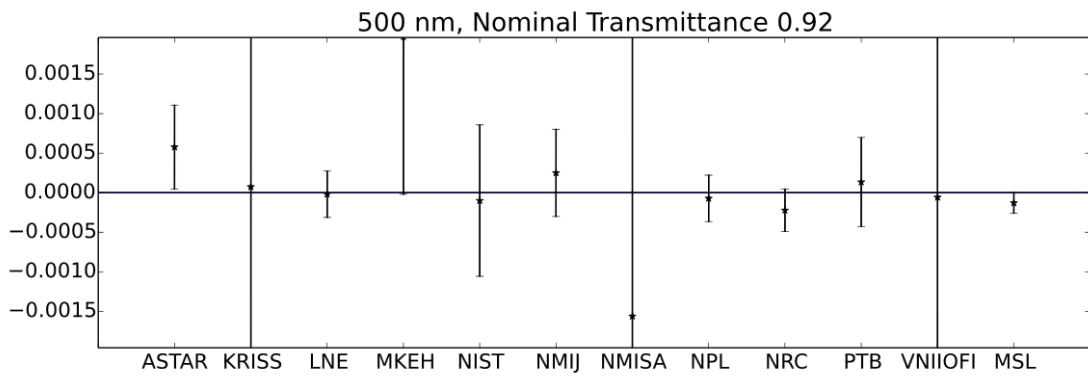
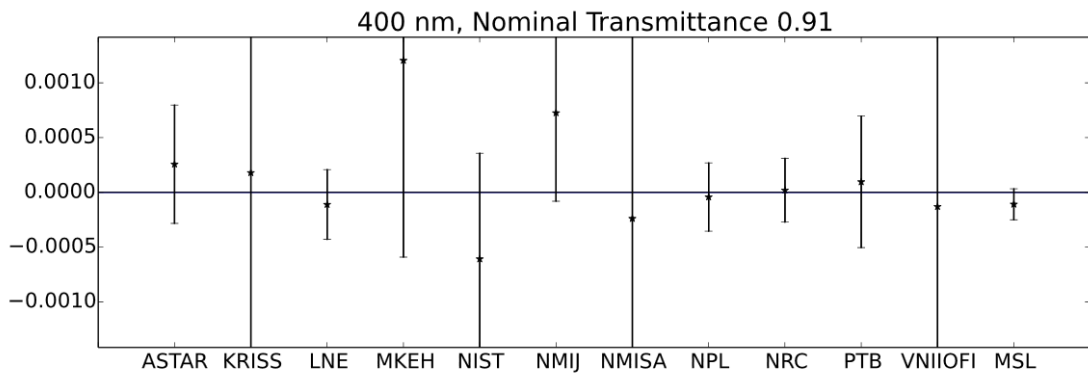
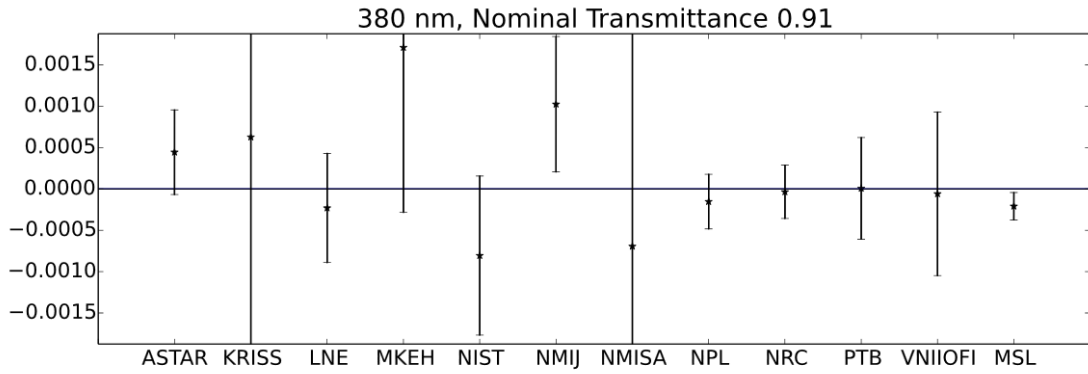
The result of the discussion was that the CCPR WG-KC agreed that Model B, which explicitly includes the degree of equivalence as a parameter of the model is appropriate for this comparison. The participants subsequently agreed to this. Global consistency checking using the  $\chi^2$  metric was therefore carried out with reference to this model.

The weights were calculated using an average of uncertainties submitted by participants at each comparison point and are given in Appendix L. Also shown in Appendix L are the weights after the Mandel-Paule process if any additional uncertainty was required to be added.

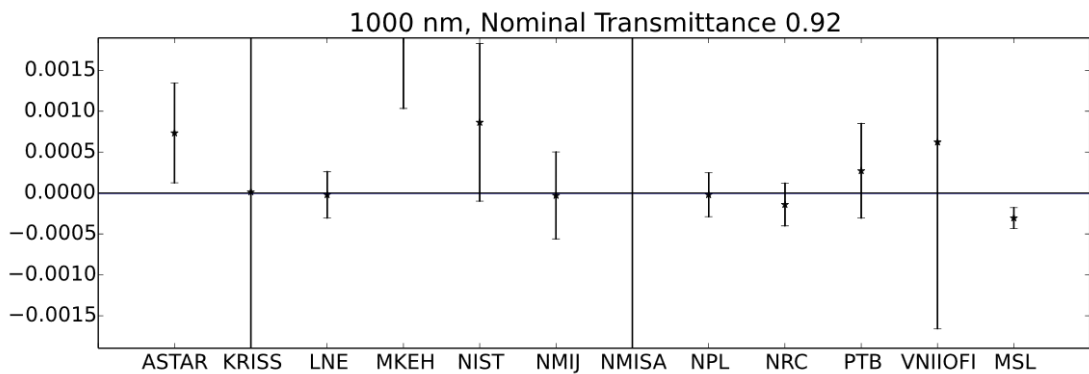
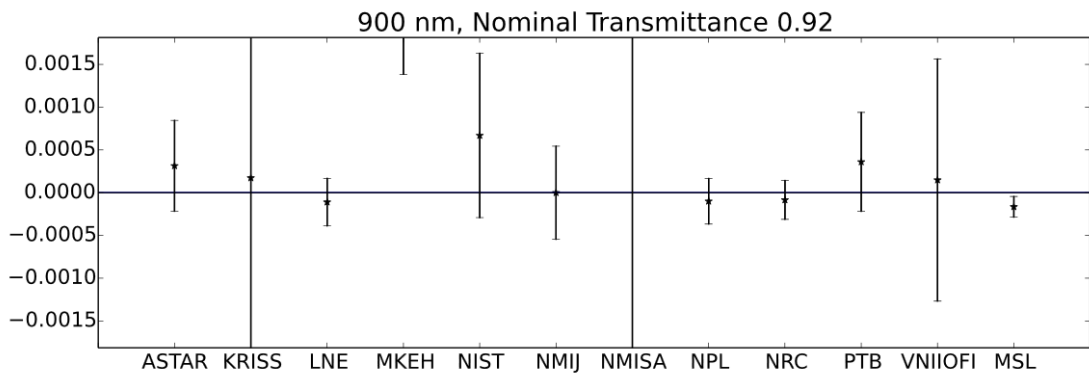
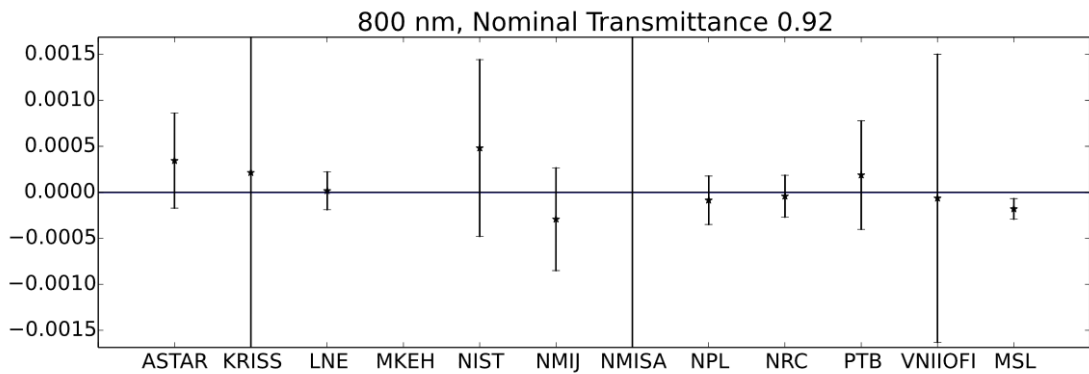
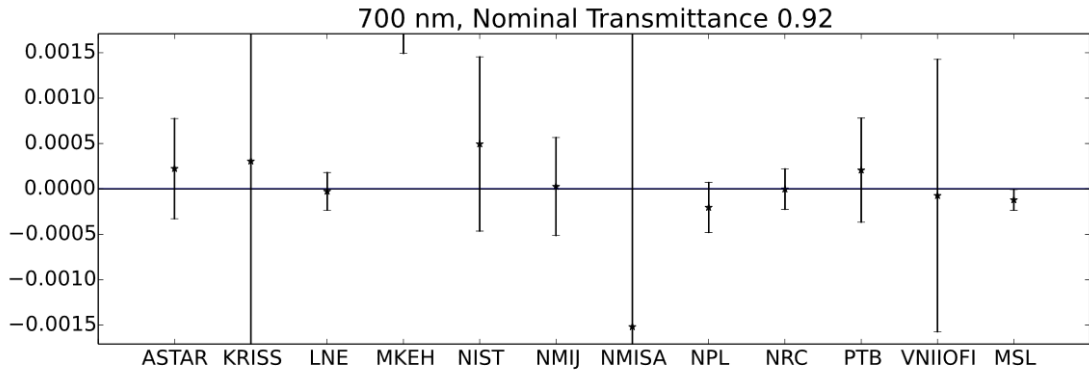
## Results

The final results for all participants at all wavelengths are shown in the following figures and tables. Note that an alternative representation of the same data is given in Appendix N where the quantity  $\frac{DoE}{U(DoE)}$  is plotted as a function of wavelength for each participant, for each of the filter types.

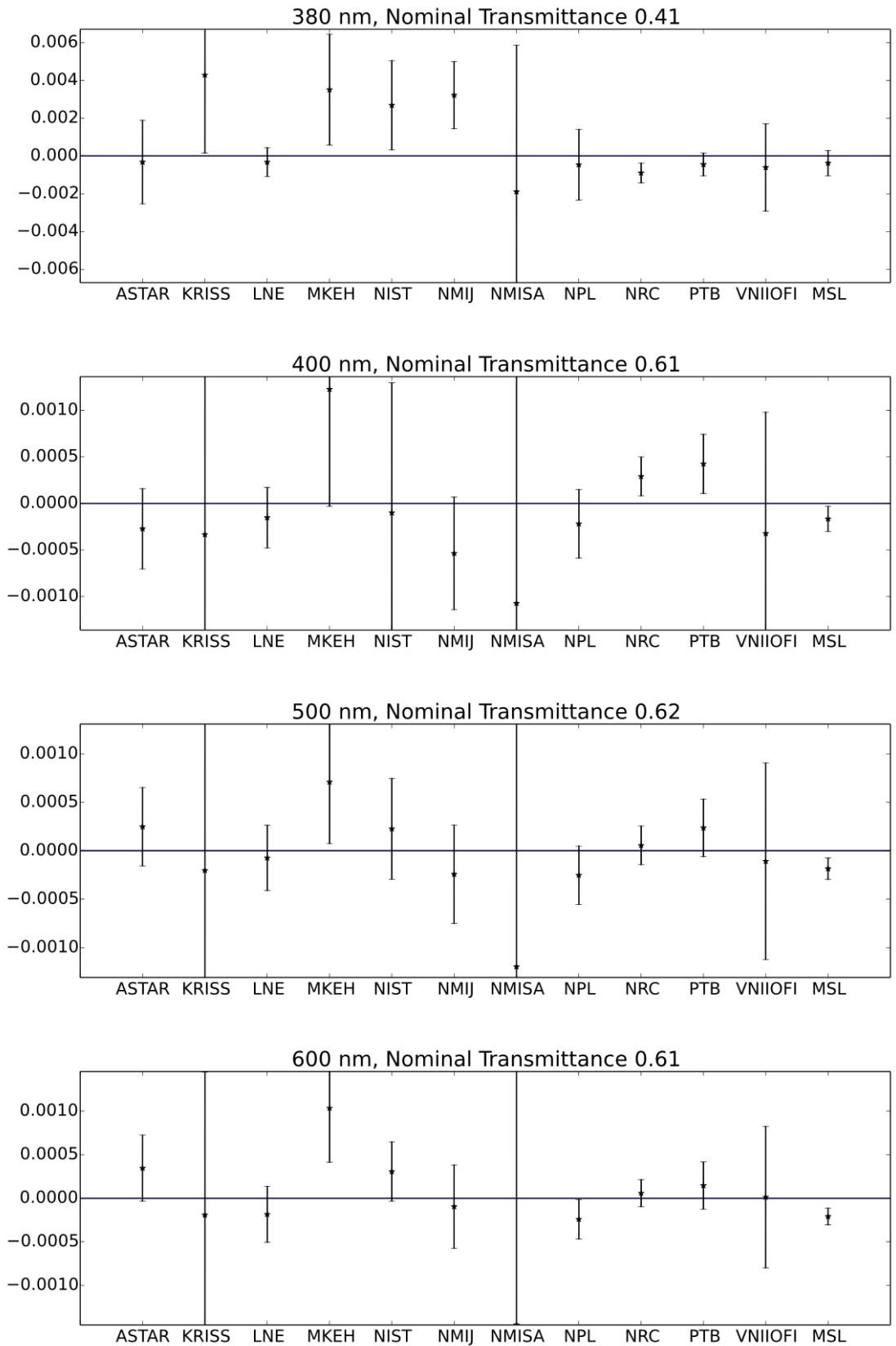
Final Results for CCPR-K6.2010 for Filter A  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



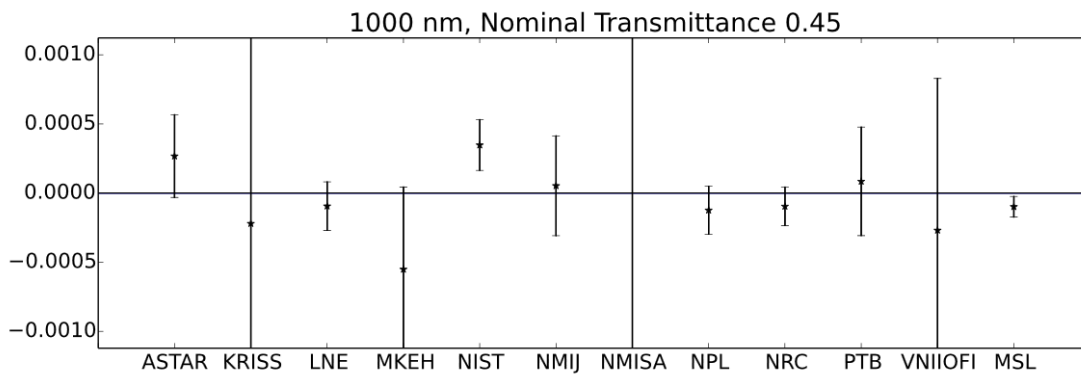
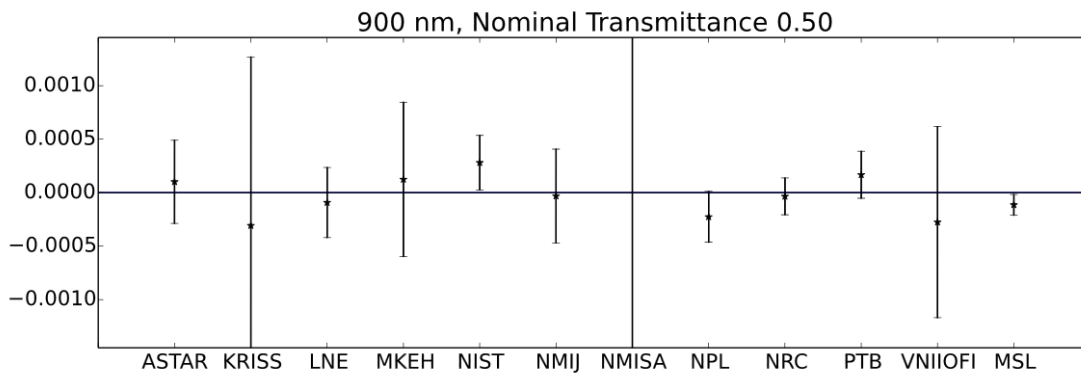
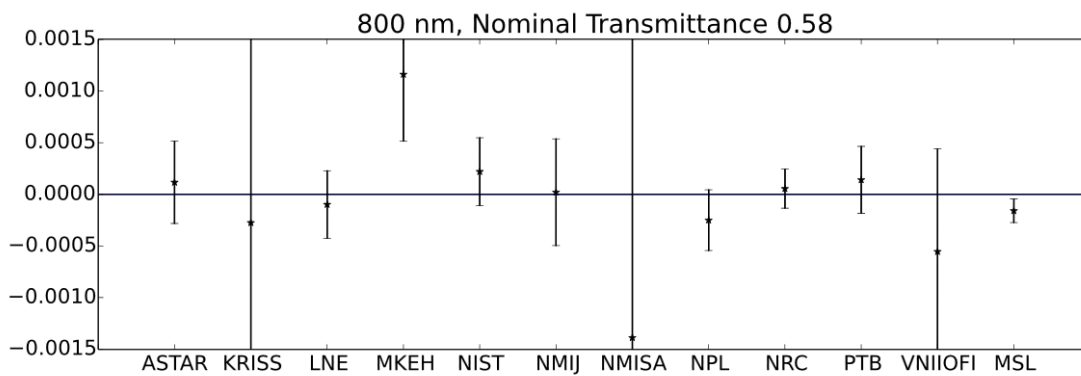
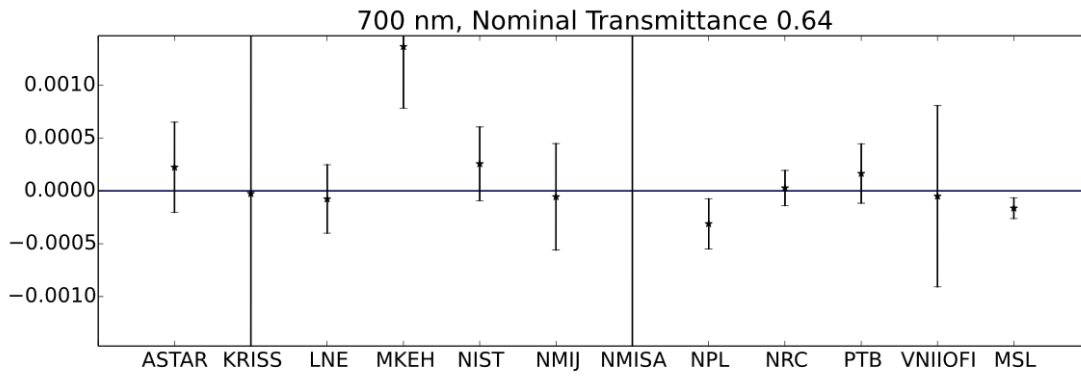
Final Results for CCPR-K6.2010 for Filter A  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



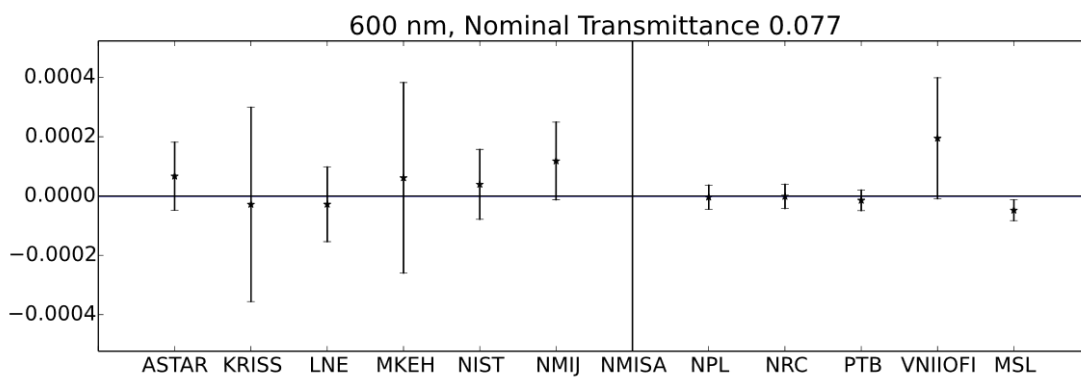
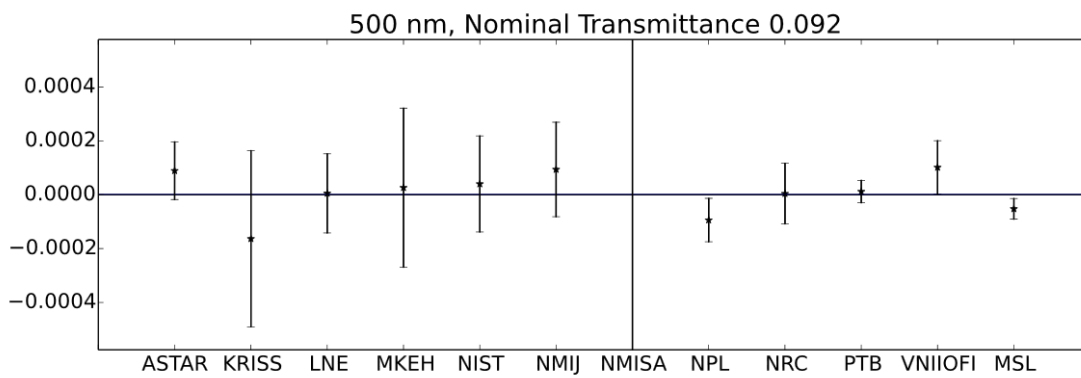
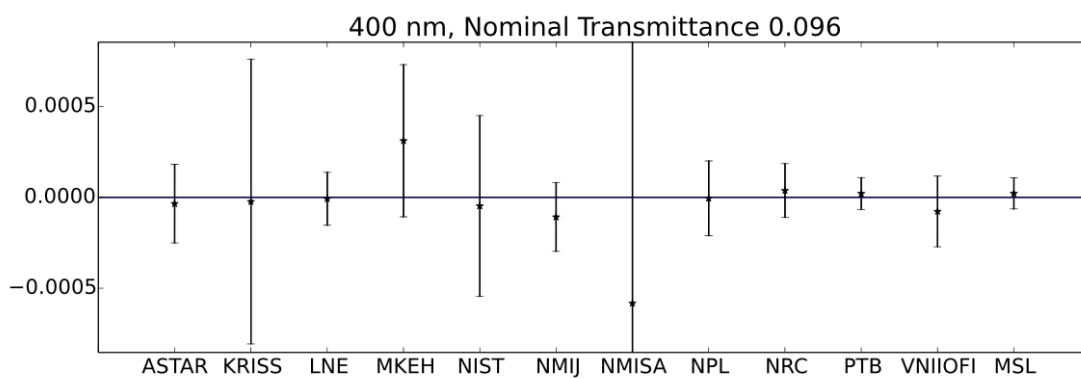
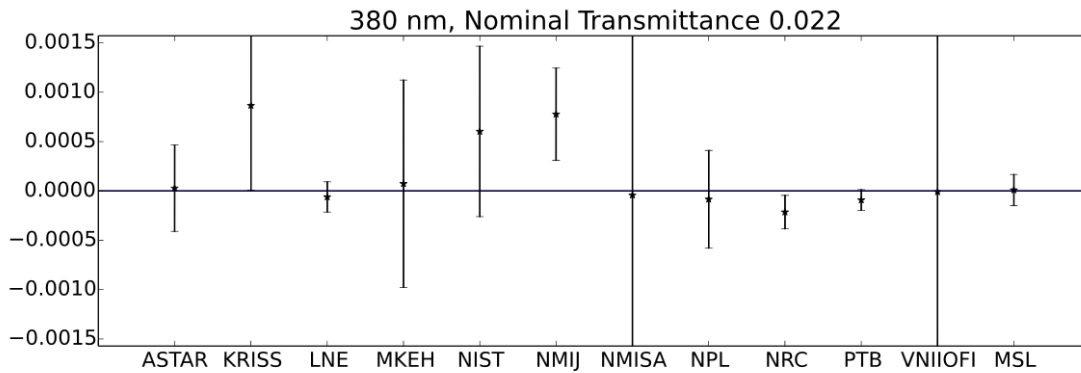
Final Results for CCPR-K6.2010 for Filter B  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



Final Results for CCPR-K6.2010 for Filter B  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

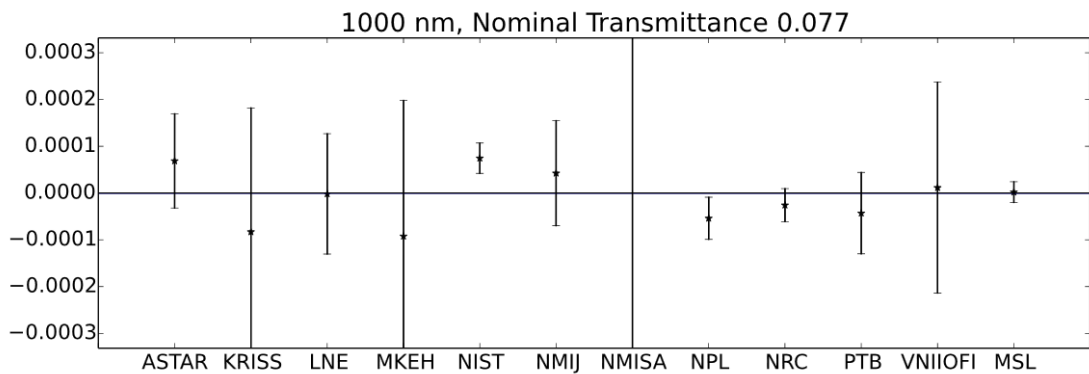
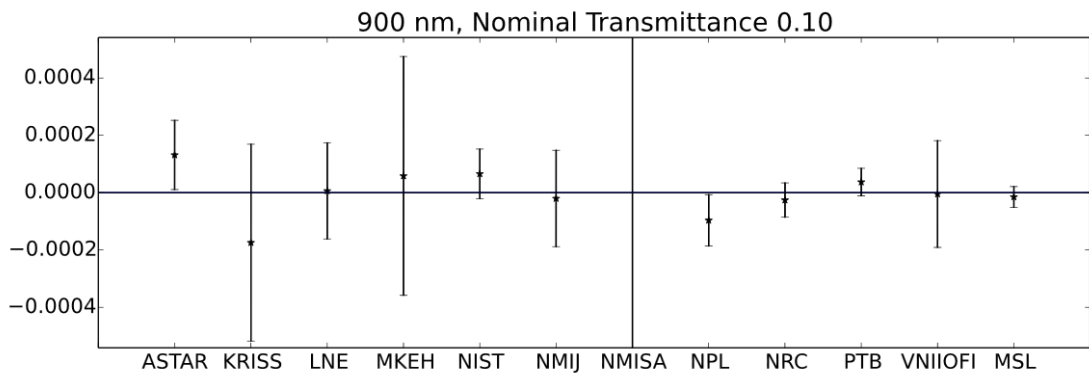
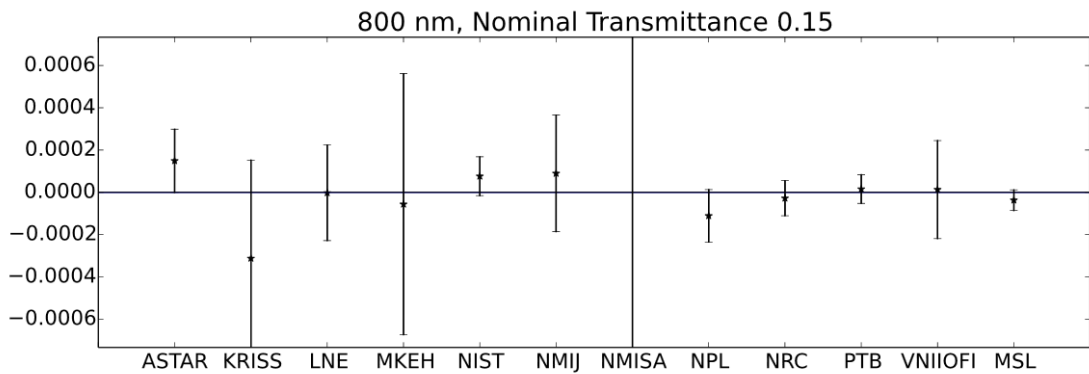
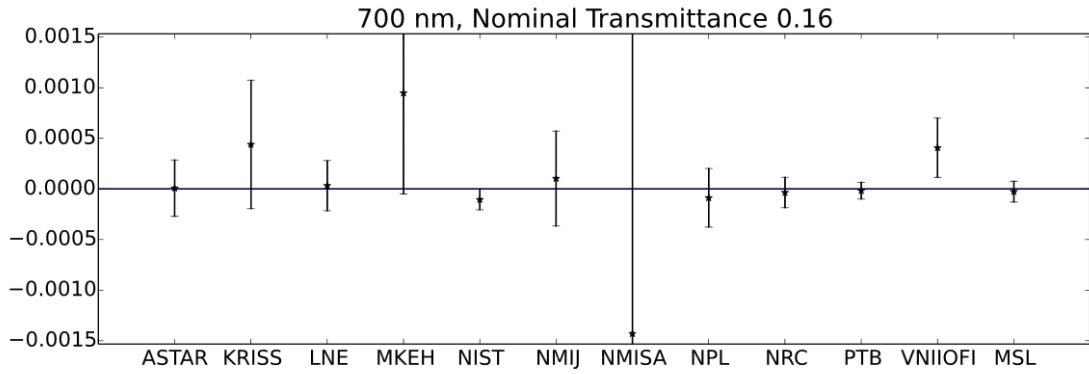


Final Results for CCPR-K6.2010 for Filter C  
 Values and expanded ( $k=2$ ) uncertainties of degrees of equivalence (DoE)

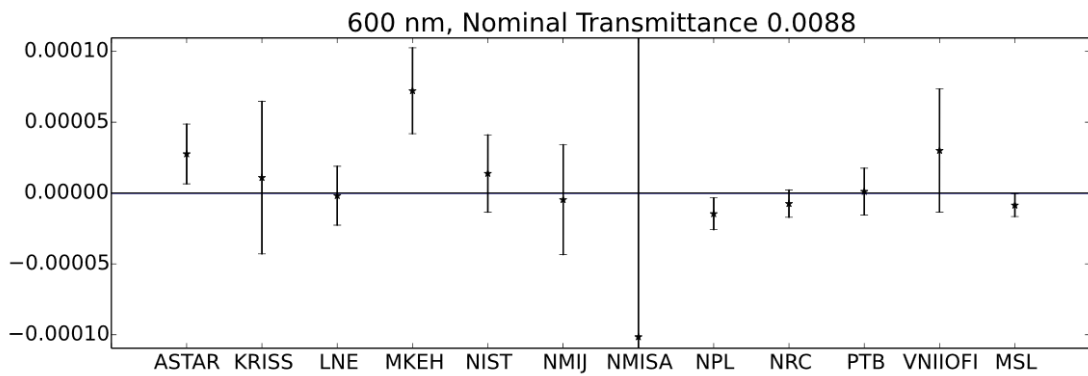
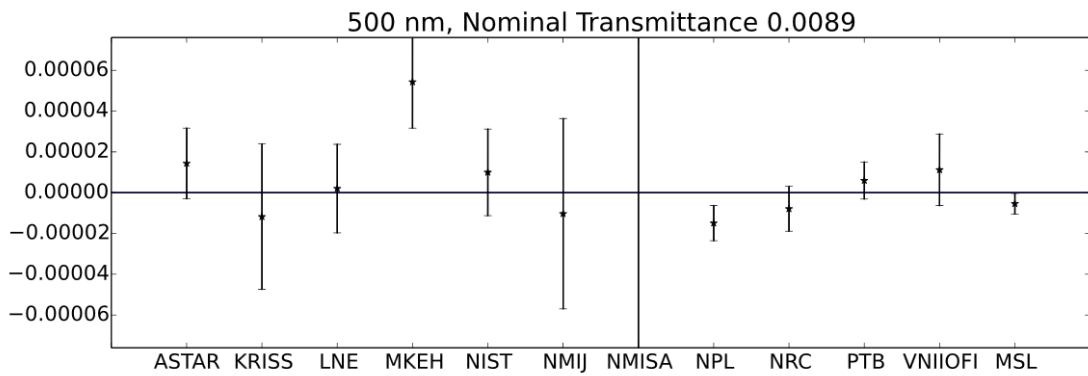
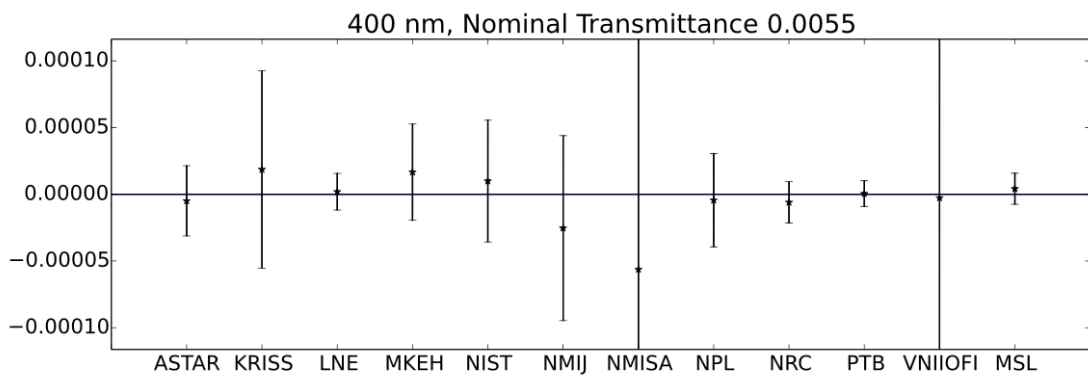
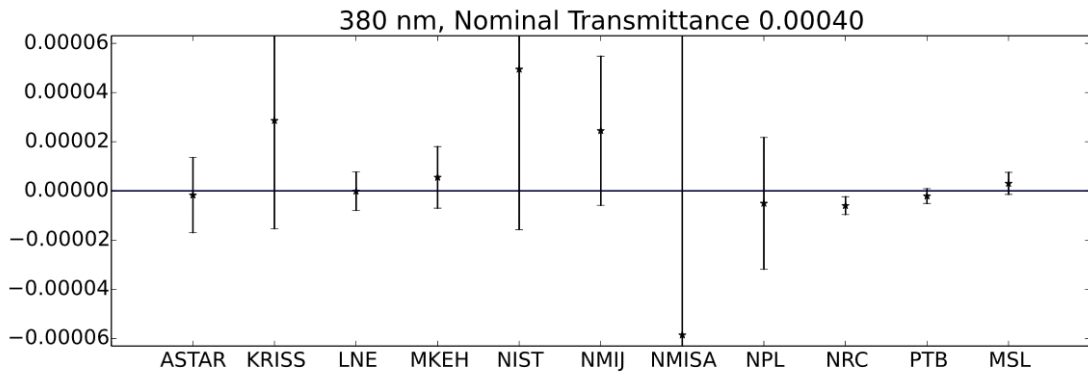




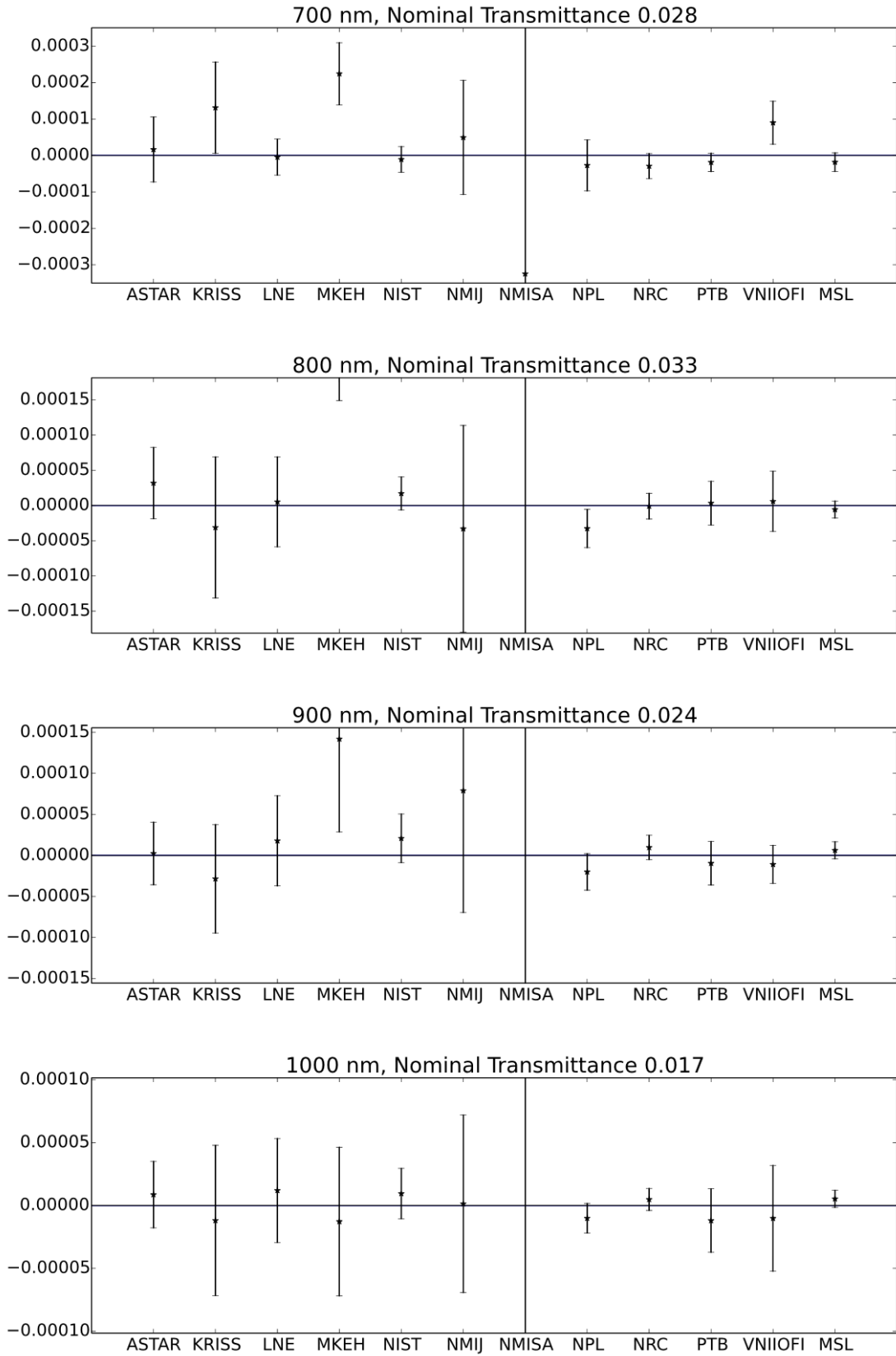
Final Results for CCPR-K6.2010 for Filter C  
 Values and expanded ( $k=2$ ) uncertainties of degrees of equivalence (DoE)



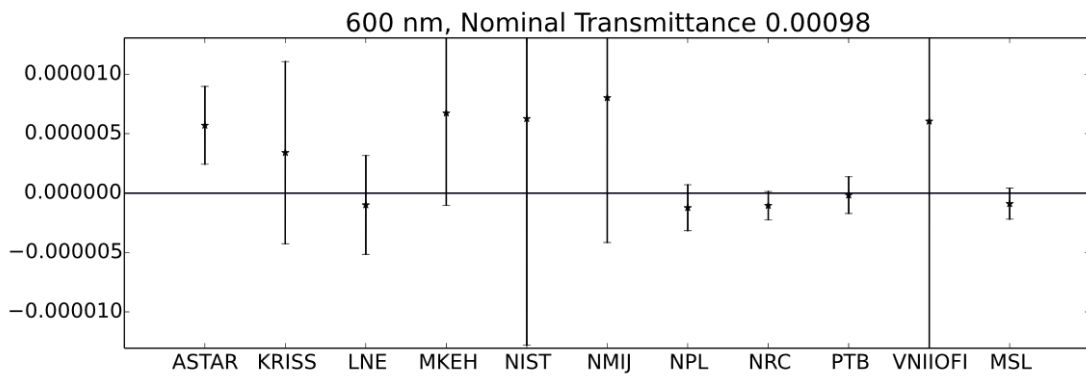
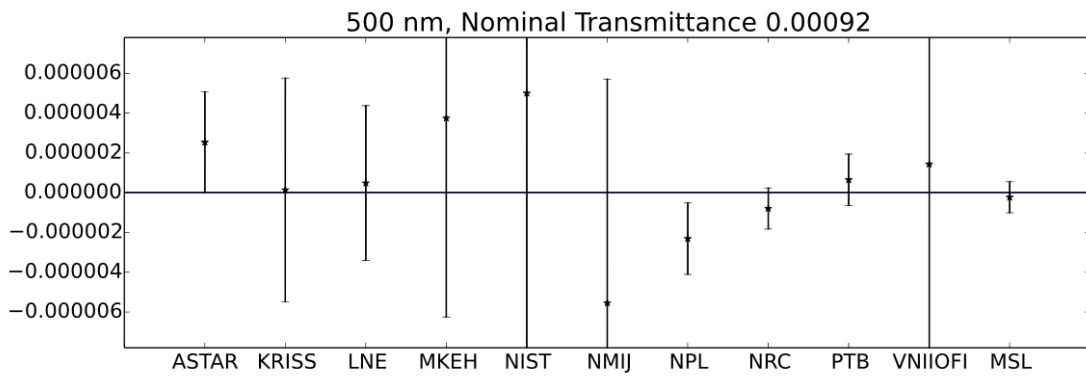
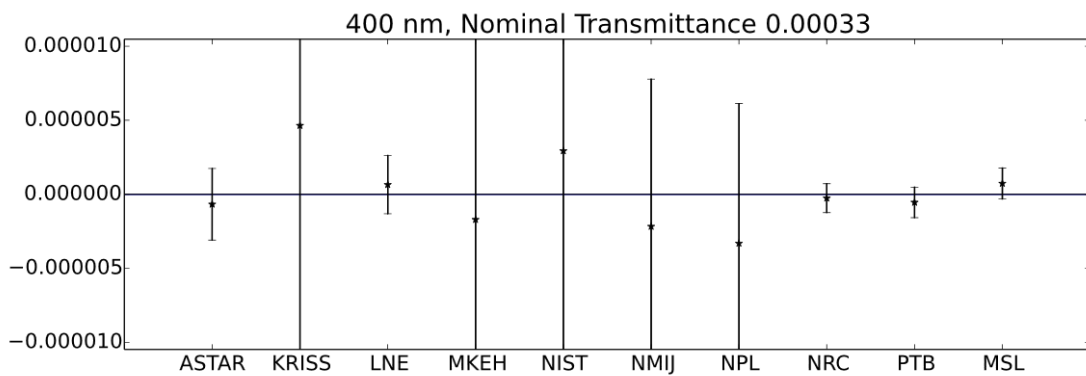
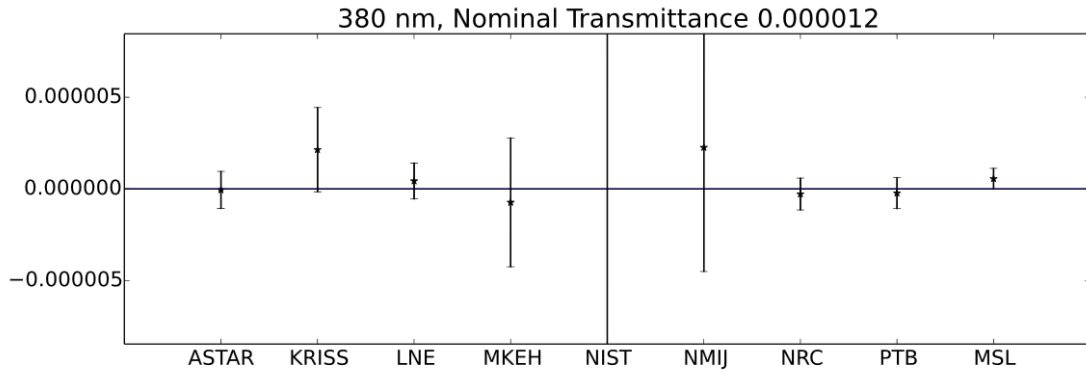
Final Results for CCPR-K6.2010 for Filter D  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



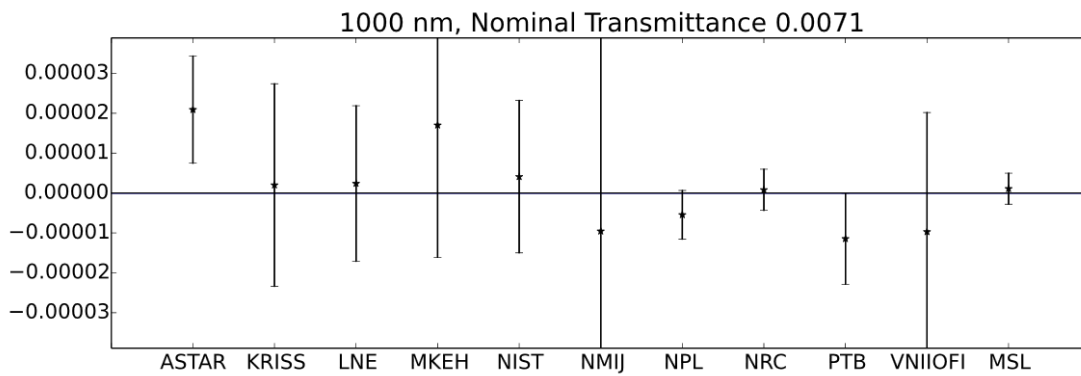
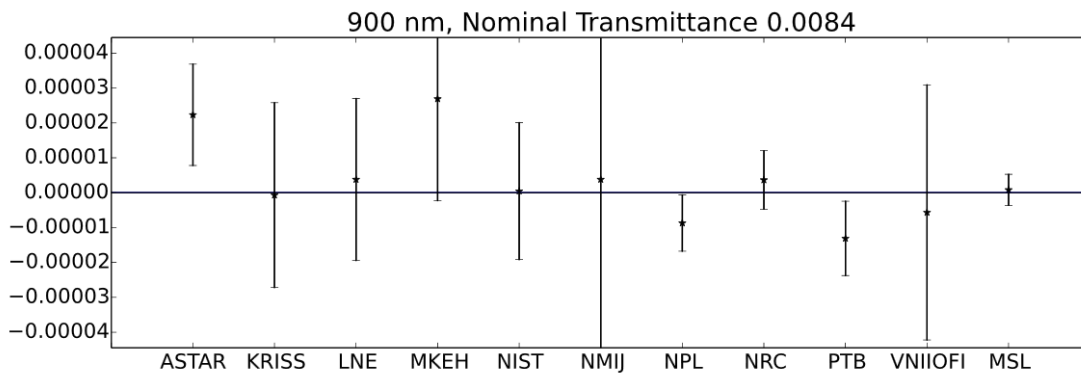
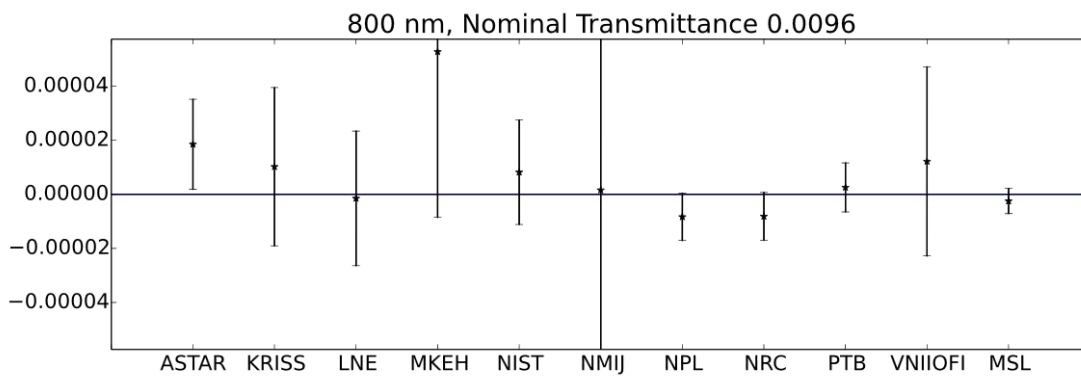
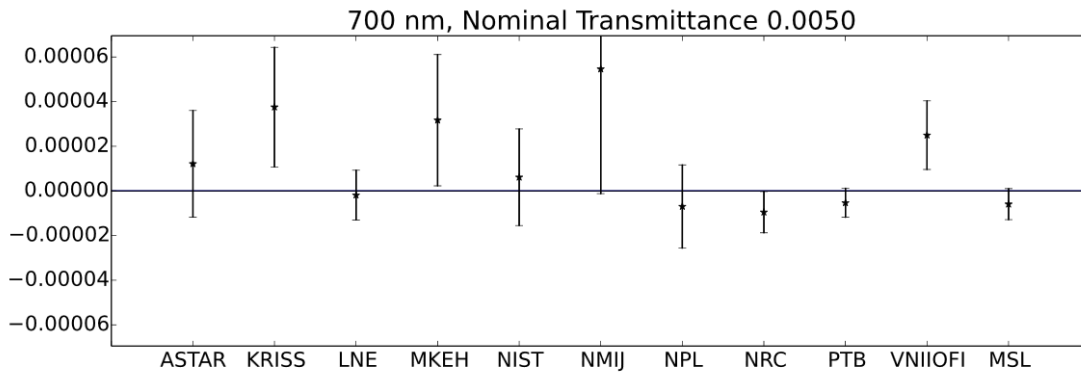
Final Results for CCPR-K6.2010 for Filter D  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



Final Results for CCPR-K6.2010 for Filter E  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



Final Results for CCPR-K6.2010 for Filter E  
 Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)



Final Results for CCPR-K6.2010 for Filter A

Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

Wavelength (nm)		380	400	500	600	700	800	900	1000
Nominal Transmittance		0.91	0.91	0.92	0.92	0.92	0.92	0.92	0.92
ASTAR	DoE	4.44e-04	2.56e-04	5.77e-04	4.51e-04	2.24e-04	3.44e-04	3.15e-04	7.33e-04
	U(DoE)	5.11e-04	5.40e-04	5.31e-04	5.63e-04	5.52e-04	5.15e-04	5.31e-04	6.09e-04
KRISS	DoE	6.27e-04	1.79e-04	7.40e-05	3.46e-04	3.05e-04	2.14e-04	1.73e-04	1.36e-05
	U(DoE)	2.85e-03	2.76e-03	2.98e-03	2.51e-03	2.44e-03	2.34e-03	2.48e-03	2.52e-03
LNE	DoE	-2.30e-04	-1.12e-04	-2.02e-05	-1.67e-04	-2.70e-05	1.64e-05	-1.10e-04	-2.12e-05
	U(DoE)	6.60e-04	3.19e-04	2.93e-04	2.08e-04	2.07e-04	2.06e-04	2.78e-04	2.84e-04
MKEH	DoE	1.71e-03	1.20e-03	1.97e-03	2.74e-03	3.28e-03	3.77e-03	3.78e-03	3.83e-03
	U(DoE)	1.99e-03	1.80e-03	1.99e-03	1.79e-03	1.79e-03	1.99e-03	2.39e-03	2.79e-03
NIST	DoE	-8.05e-04	-6.09e-04	-1.00e-04	3.22e-04	4.95e-04	4.81e-04	6.69e-04	8.63e-04
	U(DoE)	9.62e-04	9.66e-04	9.57e-04	9.57e-04	9.59e-04	9.61e-04	9.61e-04	9.62e-04
NMIJ	DoE	1.02e-03	7.26e-04	2.50e-04	6.46e-06	2.63e-05	-2.92e-04	-2.57e-07	-2.94e-05
	U(DoE)	8.19e-04	8.07e-04	5.51e-04	5.41e-04	5.40e-04	5.59e-04	5.44e-04	5.31e-04
NMISA	DoE	-6.94e-04	-2.40e-04	-1.56e-03	-1.12e-03	-1.52e-03	-1.85e-03	3.79e-03	4.16e-03
	U(DoE)	7.68e-03	8.90e-03	8.32e-03	8.19e-03	8.14e-03	1.00e-02	2.88e-02	4.30e-02
NPL	DoE	-1.53e-04	-4.29e-05	-7.19e-05	-2.26e-05	-2.04e-04	-8.65e-05	-1.00e-04	-2.08e-05
	U(DoE)	3.30e-04	3.12e-04	2.94e-04	2.71e-04	2.76e-04	2.63e-04	2.67e-04	2.68e-04
NRC	DoE	-3.53e-05	1.92e-05	-2.22e-04	-8.90e-05	-2.25e-06	-4.26e-05	-8.48e-05	-1.40e-04
	U(DoE)	3.22e-04	2.92e-04	2.67e-04	2.32e-04	2.23e-04	2.28e-04	2.27e-04	2.61e-04
PTB	DoE	7.33e-06	9.53e-05	1.35e-04	1.95e-04	2.07e-04	1.87e-04	3.60e-04	2.72e-04
	U(DoE)	6.14e-04	6.01e-04	5.63e-04	5.64e-04	5.74e-04	5.90e-04	5.79e-04	5.79e-04
VNIIOFI	DoE	-5.92e-05	-1.31e-04	-5.83e-05	-6.07e-05	-7.36e-05	-6.46e-05	1.48e-04	6.22e-04
	U(DoE)	9.89e-04	2.55e-03	2.59e-03	1.96e-03	1.50e-03	1.57e-03	1.42e-03	2.28e-03
MSL	DoE	-2.09e-04	-1.09e-04	-1.30e-04	-8.75e-05	-1.21e-04	-1.81e-04	-1.65e-04	-3.05e-04
	U(DoE)	1.65e-04	1.42e-04	1.31e-04	1.15e-04	1.14e-04	1.12e-04	1.21e-04	1.26e-04

Final Results for CCPR-K6.2010 for Filter B

Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

Wavelength (nm)		380	400	500	600	700	800	900	1000
Nominal Transmittance		0.41	0.61	0.62	0.61	0.64	0.58	0.50	0.45
ASTAR	DoE	-3.26e-04	-2.74e-04	2.48e-04	3.45e-04	2.24e-04	1.16e-04	1.02e-04	2.67e-04
	U(DoE)	2.21e-03	4.31e-04	4.03e-04	3.78e-04	4.27e-04	3.98e-04	3.89e-04	2.99e-04
KRISS	DoE	4.28e-03	-3.35e-04	-2.03e-04	-1.93e-04	-2.50e-05	-2.75e-04	-3.08e-04	-2.21e-04
	U(DoE)	4.13e-03	2.19e-03	1.86e-03	1.64e-03	1.93e-03	2.26e-03	1.58e-03	1.43e-03
LNE	DoE	-3.28e-04	-1.53e-04	-7.36e-05	-1.86e-04	-7.57e-05	-9.85e-05	-9.21e-05	-9.45e-05
	U(DoE)	7.57e-04	3.25e-04	3.37e-04	3.21e-04	3.24e-04	3.27e-04	3.28e-04	1.75e-04
MKEH	DoE	3.51e-03	1.23e-03	7.10e-04	1.03e-03	1.37e-03	1.16e-03	1.24e-04	-5.52e-04
	U(DoE)	2.93e-03	1.26e-03	6.34e-04	6.22e-04	5.83e-04	6.46e-04	7.21e-04	5.96e-04
NIST	DoE	2.68e-03	-1.01e-04	2.27e-04	3.06e-04	2.57e-04	2.20e-04	2.81e-04	3.47e-04
	U(DoE)	2.36e-03	1.40e-03	5.20e-04	3.41e-04	3.49e-04	3.28e-04	2.55e-04	1.83e-04
NMIJ	DoE	3.22e-03	-5.37e-04	-2.42e-04	-9.59e-05	-5.57e-05	2.02e-05	-3.13e-05	5.25e-05
	U(DoE)	1.78e-03	6.04e-04	5.07e-04	4.78e-04	5.04e-04	5.17e-04	4.38e-04	3.61e-04
NMISA	DoE	-1.90e-03	-1.07e-03	-1.20e-03	-1.45e-03	-1.67e-03	-1.39e-03	1.54e-02	1.20e-02
	U(DoE)	7.75e-03	8.86e-03	8.28e-03	8.22e-03	8.12e-03	1.00e-02	2.88e-02	4.29e-02
NPL	DoE	-4.65e-04	-2.19e-04	-2.52e-04	-2.42e-04	-3.11e-04	-2.51e-04	-2.26e-04	-1.24e-04
	U(DoE)	1.87e-03	3.67e-04	3.01e-04	2.27e-04	2.37e-04	2.94e-04	2.38e-04	1.73e-04
NRC	DoE	-9.02e-04	2.90e-04	5.59e-05	5.76e-05	2.77e-05	5.44e-05	-3.46e-05	-9.60e-05
	U(DoE)	5.24e-04	2.08e-04	1.99e-04	1.55e-04	1.66e-04	1.89e-04	1.72e-04	1.39e-04
PTB	DoE	-4.52e-04	4.24e-04	2.36e-04	1.46e-04	1.65e-04	1.40e-04	1.68e-04	8.46e-05
	U(DoE)	6.02e-04	3.17e-04	2.97e-04	2.70e-04	2.81e-04	3.24e-04	2.20e-04	3.93e-04
VNIIOFI	DoE	-6.11e-04	-3.24e-04	-1.08e-04	1.27e-05	-5.02e-05	-5.55e-04	-2.76e-04	-2.70e-04
	U(DoE)	2.30e-03	1.30e-03	1.01e-03	8.12e-04	8.58e-04	9.94e-04	8.93e-04	1.10e-03
MSL	DoE	-3.80e-04	-1.66e-04	-1.85e-04	-2.10e-04	-1.63e-04	-1.59e-04	-1.14e-04	-9.90e-05
	U(DoE)	6.71e-04	1.35e-04	1.11e-04	9.70e-05	9.79e-05	1.14e-04	9.67e-05	7.48e-05

Final Results for CCPR-K6.2010 for Filter C

Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

Wavelength (nm)		380	400	500	600	700	800	900	1000
Nominal Transmittance		0.022	0.096	0.092	0.077	0.16	0.15	0.10	0.077
ASTAR	DoE	2.76e-05	-3.51e-05	8.89e-05	6.69e-05	7.55e-06	1.49e-04	1.32e-04	6.87e-05
	U(DoE)	4.37e-04	2.16e-04	1.07e-04	1.15e-04	2.79e-04	1.49e-04	1.21e-04	1.01e-04
KRISS	DoE	8.65e-04	-2.35e-05	-1.64e-04	-2.83e-05	4.39e-04	-3.12e-04	-1.74e-04	-8.30e-05
	U(DoE)	8.58e-04	7.83e-04	3.27e-04	3.28e-04	6.34e-04	4.65e-04	3.43e-04	2.65e-04
LNE	DoE	-6.08e-05	-8.16e-06	4.72e-06	-2.78e-05	3.22e-05	-2.54e-06	6.18e-06	-1.74e-06
	U(DoE)	1.53e-04	1.46e-04	1.47e-04	1.26e-04	2.48e-04	2.26e-04	1.68e-04	1.29e-04
MKEH	DoE	7.35e-05	3.11e-04	2.61e-05	6.13e-05	9.48e-04	-5.64e-05	5.84e-05	-9.22e-05
	U(DoE)	1.05e-03	4.19e-04	2.95e-04	3.21e-04	9.98e-04	6.18e-04	4.16e-04	2.90e-04
NIST	DoE	6.03e-04	-4.78e-05	3.99e-05	3.95e-05	-1.05e-04	7.61e-05	6.59e-05	7.45e-05
	U(DoE)	8.63e-04	4.97e-04	1.78e-04	1.18e-04	1.01e-04	9.19e-05	8.63e-05	3.24e-05
NMIJ	DoE	7.77e-04	-1.08e-04	9.36e-05	1.18e-04	1.03e-04	8.94e-05	-2.02e-05	4.24e-05
	U(DoE)	4.67e-04	1.89e-04	1.75e-04	1.31e-04	4.70e-04	2.76e-04	1.68e-04	1.12e-04
NMISA	DoE	-4.30e-05	-5.83e-04	-6.80e-04	-5.90e-04	-1.43e-03	-9.62e-04	5.53e-03	4.57e-03
	U(DoE)	1.03e-02	9.30e-03	8.45e-03	9.21e-03	8.30e-03	1.01e-02	2.88e-02	4.30e-02
NPL	DoE	-8.41e-05	-5.72e-06	-9.41e-05	-3.72e-06	-8.76e-05	-1.11e-04	-9.64e-05	-5.40e-05
	U(DoE)	4.94e-04	2.06e-04	8.06e-05	4.07e-05	2.90e-04	1.24e-04	8.95e-05	4.50e-05
NRC	DoE	-2.14e-04	3.72e-05	4.03e-06	-1.33e-06	-3.56e-05	-2.81e-05	-2.58e-05	-2.58e-05
	U(DoE)	1.69e-04	1.48e-04	1.12e-04	4.10e-05	1.50e-04	8.29e-05	6.00e-05	3.53e-05
PTB	DoE	-9.12e-05	2.09e-05	1.17e-05	-1.45e-05	-1.71e-05	1.56e-05	3.72e-05	-4.29e-05
	U(DoE)	1.04e-04	8.75e-05	4.16e-05	3.48e-05	8.31e-05	6.82e-05	4.78e-05	8.70e-05
VNIIOFI	DoE	-9.28e-06	-7.78e-05	1.01e-04	1.95e-04	4.07e-04	1.28e-05	-4.65e-06	1.15e-05
	U(DoE)	2.25e-03	1.94e-04	9.91e-05	2.04e-04	2.93e-04	2.32e-04	1.86e-04	2.25e-04
MSL	DoE	9.57e-06	2.13e-05	-5.26e-05	-4.79e-05	-2.65e-05	-3.73e-05	-1.48e-05	1.99e-06
	U(DoE)	1.57e-04	8.53e-05	3.84e-05	3.49e-05	1.03e-04	4.89e-05	3.61e-05	2.21e-05



Final Results for CCPR-K6.2010 for Filter D

Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

Wavelength (nm)		380	400	500	600	700	800	900	1000
Nominal Transmittance		.0004	.0055	.0089	.0088	0.028	0.033	0.024	0.017
ASTAR	DoE	-1.71e-06	-4.90e-06	1.44e-05	2.76e-05	1.63e-05	3.18e-05	2.45e-06	8.61e-06
	U(DoE)	1.53e-05	2.63e-05	1.73e-05	2.11e-05	8.93e-05	5.06e-05	3.81e-05	2.65e-05
KRISS	DoE	2.86e-05	1.86e-05	-1.18e-05	1.09e-05	1.31e-04	-3.12e-05	-2.84e-05	-1.19e-05
	U(DoE)	4.40e-05	7.39e-05	3.57e-05	5.38e-05	1.26e-04	1.00e-04	6.61e-05	5.97e-05
LNE	DoE	-1.19e-07	1.93e-06	2.00e-06	-1.87e-06	-4.58e-06	5.10e-06	1.78e-05	1.19e-05
	U(DoE)	7.80e-06	1.37e-05	2.17e-05	2.08e-05	4.93e-05	6.38e-05	5.50e-05	4.14e-05
MKEH	DoE	5.51e-06	1.66e-05	5.43e-05	7.22e-05	2.24e-04	3.21e-04	1.42e-04	-1.28e-05
	U(DoE)	1.25e-05	3.61e-05	2.26e-05	3.03e-05	8.51e-05	1.72e-04	1.13e-04	5.91e-05
NIST	DoE	4.95e-05	9.93e-06	9.96e-06	1.38e-05	-1.08e-05	1.70e-05	2.09e-05	9.46e-06
	U(DoE)	6.52e-05	4.56e-05	2.12e-05	2.73e-05	3.52e-05	2.34e-05	2.96e-05	2.00e-05
NMIJ	DoE	2.45e-05	-2.54e-05	-1.03e-05	-4.69e-06	4.95e-05	-3.31e-05	7.90e-05	1.29e-06
	U(DoE)	3.03e-05	6.93e-05	4.67e-05	3.88e-05	1.57e-04	1.47e-04	1.48e-04	7.06e-05
NMISA	DoE	-5.86e-05	-5.62e-05	-9.01e-05	-1.02e-04	-3.25e-04	-2.55e-04	1.41e-03	9.48e-04
	U(DoE)	8.50e-03	1.61e-02	8.70e-03	1.29e-02	9.49e-03	1.06e-02	3.00e-02	4.36e-02
NPL	DoE	-5.05e-06	-4.39e-06	-1.49e-05	-1.46e-05	-2.73e-05	-3.28e-05	-2.01e-05	-1.02e-05
	U(DoE)	2.68e-05	3.50e-05	8.63e-06	1.12e-05	7.00e-05	2.71e-05	2.22e-05	1.18e-05
NRC	DoE	-5.98e-06	-6.04e-06	-7.91e-06	-7.48e-06	-2.92e-05	-9.97e-07	9.73e-06	4.77e-06
	U(DoE)	3.63e-06	1.55e-05	1.10e-05	9.63e-06	3.42e-05	1.83e-05	1.48e-05	8.77e-06
PTB	DoE	-2.10e-06	5.31e-07	5.98e-06	1.05e-06	-1.90e-05	3.28e-06	-9.57e-06	-1.20e-05
	U(DoE)	3.00e-06	9.58e-06	9.10e-06	1.65e-05	2.54e-05	3.11e-05	2.66e-05	2.53e-05
VNIIOFI	DoE	-	-2.67e-06	1.12e-05	3.00e-05	8.98e-05	5.86e-06	-1.09e-05	-1.02e-05
	U(DoE)	-	2.51e-04	1.76e-05	4.34e-05	5.90e-05	4.27e-05	2.31e-05	4.21e-05
MSL	DoE	3.06e-06	4.15e-06	-5.39e-06	-8.62e-06	-1.84e-05	-5.85e-06	6.28e-06	5.28e-06
	U(DoE)	4.48e-06	1.16e-05	5.07e-06	7.95e-06	2.55e-05	1.21e-05	1.04e-05	6.77e-06

Final Results for CCPR-K6.2010 for Filter E

Values and expanded (k=2) uncertainties of degrees of equivalence (DoE)

Wavelength (nm)		380	400	500	600	700	800	900	1000
Nominal Transmittance		.000012	.00033	.00092	.00098	.0050	.0096	.0084	.0071
ASTAR	DoE	-5.40e-08	-6.73e-07	2.53e-06	5.70e-06	1.22e-05	1.85e-05	2.23e-05	2.09e-05
	U(DoE)	1.01e-06	2.42e-06	2.54e-06	3.28e-06	2.38e-05	1.67e-05	1.45e-05	1.34e-05
KRISS	DoE	2.14e-06	4.64e-06	1.36e-07	3.40e-06	3.76e-05	1.02e-05	-7.11e-07	2.00e-06
	U(DoE)	2.30e-06	1.66e-05	5.62e-06	7.66e-06	2.68e-05	2.93e-05	2.65e-05	2.54e-05
LNE	DoE	4.34e-07	6.53e-07	4.85e-07	-1.00e-06	-1.86e-06	-1.51e-06	3.78e-06	2.40e-06
	U(DoE)	9.80e-07	1.97e-06	3.89e-06	4.15e-06	1.11e-05	2.49e-05	2.32e-05	1.95e-05
MKEH	DoE	-7.35e-07	-1.71e-06	3.75e-06	6.73e-06	3.17e-05	5.27e-05	2.69e-05	1.70e-05
	U(DoE)	3.51e-06	1.51e-05	1.00e-05	7.75e-06	2.94e-05	6.12e-05	2.92e-05	3.31e-05
NIST	DoE	1.38e-05	2.93e-06	5.00e-06	6.26e-06	6.14e-06	8.15e-06	4.44e-07	4.10e-06
	U(DoE)	3.81e-05	2.98e-05	1.88e-05	1.91e-05	2.16e-05	1.93e-05	1.96e-05	1.91e-05
NMIJ	DoE	2.26e-06	-2.17e-06	-5.55e-06	8.01e-06	5.46e-05	1.57e-06	3.79e-06	-9.56e-06
	U(DoE)	6.76e-06	9.95e-06	1.13e-05	1.22e-05	5.58e-05	8.85e-05	9.12e-05	6.99e-05
NMISA	DoE	-	-	-	-	-	-	-	-
	U(DoE)	-	-	-	-	-	-	-	-
NPL	DoE	-	-3.31e-06	-2.31e-06	-1.24e-06	-6.97e-06	-8.35e-06	-8.71e-06	-5.45e-06
	U(DoE)	-	9.43e-06	1.80e-06	1.93e-06	1.86e-05	8.72e-06	8.08e-06	6.10e-06
NRC	DoE	-2.77e-07	-2.61e-07	-7.97e-07	-1.05e-06	-9.52e-06	-8.15e-06	3.65e-06	8.10e-07
	U(DoE)	8.67e-07	9.77e-07	1.03e-06	1.19e-06	9.26e-06	8.84e-06	8.37e-06	5.17e-06
PTB	DoE	-2.27e-07	-5.46e-07	6.47e-07	-1.76e-07	-5.32e-06	2.55e-06	-1.31e-05	-1.14e-05
	U(DoE)	8.44e-07	1.03e-06	1.29e-06	1.54e-06	6.49e-06	9.06e-06	1.07e-05	1.14e-05
VNIIOFI	DoE	-	-	1.43e-06	6.04e-06	2.50e-05	1.22e-05	-5.66e-06	-9.72e-06
	U(DoE)	-	-	1.63e-05	2.06e-05	1.54e-05	3.49e-05	3.66e-05	2.99e-05
MSL	DoE	5.57e-07	7.34e-07	-2.30e-07	-8.97e-07	-5.93e-06	-2.49e-06	8.21e-07	1.09e-06
	U(DoE)	5.64e-07	1.05e-06	7.80e-07	1.31e-06	6.95e-06	4.64e-06	4.45e-06	3.89e-06

## Linking to this Comparison

In order to link Regional Metrology Organisation (RMO) comparisons to this Consultative Committee (CC) comparison of regular transmittance a similar analysis method as used in this comparison can be used. However, instead of using a weighted mean to determine reference values, the degrees of equivalence of linking participants (those participants who have participated in the CC comparison and also in the RMO comparison) can be considered fixed.

The important thing to keep in mind when carrying out analysis of a linked comparison is increased sources of covariance between measurements. In the CC comparison, participants must realise scales independently, so there is no covariance between participants, only between measurements made by any particular participant. However, in an RMO comparison there may be several sources of covariance between measurements:

- Between measurements of different participants due to common traceability.
- Between measurements made during the RMO comparison by linking participants and their degrees of equivalence, and the degrees of equivalence of the other linking participants.
- Between the degrees of equivalence of all linking participants.

The covariances between all degrees of equivalence,  $(\Delta_i, \Delta_j)$ , are available from matrix  $\text{cov}(\hat{\beta})$  and are tabulated in Appendix M for use in RMO comparisons. And since the use of the degrees of equivalence determined in the CC comparison as reference points for RMO comparisons implies an assumption the systematic components of uncertainty for those participants are fixed, then the covariances between RMO measurements and degrees of equivalence,  $u(\Delta_i, y_{i,f,r})$  and  $u(\Delta_i, y_{j,f,r})$ , are also fixed and can be determined from the CC data. These have also been evaluated, and are given in Appendix M.

## Conclusion

Most importantly, the results of this comparison show that the measurement of regular spectral transmittance is mature enough to enable meaningful comparisons of scales and calculations of reference values. Most laboratories have the capability to both measure regular transmittance, and evaluate uncertainty budgets adequately. There are some cases of underestimated uncertainties, and some cases of overestimated uncertainties.

It should be remembered that the 'true values' of the artefacts are defined, for the purposes of CCPR comparisons, as the weighted average (with cut-off) of the participants' measurement results. They are, therefore, a function of the set of participants chosen for the comparison and the state of their measurement systems at the time of the comparison. Another set of participants, at another time, may deliver different reference values; therefore the final degrees of equivalence should be considered in this light. Adjustments to uncertainty budgets in response to the results should, as always, be associated with physical justifications.

Two important factors relating to the neutral density filters used in this comparison contributed to the ease of the analysis and the reliability of the results. Firstly, the artefacts were established to be stable before the comparison began; secondly, a strong temperature dependence of transmittance at several wavelengths was identified and taken account of. Although the work on these two effects resulted in a delay and a large expense on the part of the pilot, it meant that there were very few data points rejected from the analysis, no model for filter instability was required, inconsistency (using Model B, equation (2)) was very low and the uncertainties added after the Mandel-Paule process did not significantly change the equivalence of participants.

## Effect of Extra Pilot Measurements

During the analysis of CCPR K1a [6], it was noted that because the pilot made many more measurements than any other laboratory, any uncorrelated components of uncertainty were almost entirely absent from the final degrees of equivalence for the pilot, but there were still substantial components of uncertainty in the degrees of equivalence for all other participants. This was perceived to be of relative disadvantage to the pilot – the pilot was subjected to a much ‘stricter’ test of their uncertainty budgets than any of the participants. To make the test more equitable, the pilot of K1a chose to add an additional component of uncertainty to the pilot’s degrees of equivalence, inflating the uncertainty to the level it would have been if they had made the same number of measurements as the participants. This step makes no difference to any participant except for the pilot, as the uncertainty component is added after the analysis is complete.

For *this* comparison, the pilot has declined to add this extra component of uncertainty. MSL prefers to consider that as pilot, one compensation for making so many measurements is that it has more information about the degrees of equivalence (and therefore any potential systematic bias in the measurement) than other participants. It can be seen from the results that MSL did in fact ‘fail’ at more points than most other participants. Arguably, even if MSL had not made the extra measurements, the bias would still exist; it just would not be revealed by the comparison. And in fact, adding the uncertainty component to compensate for multiple measurements would only change the result at a few points.

## Effect of Cut-off

The CCPR choice of constraint is the weighted mean with cut-off. The cut-off is the average of the uncertainty values of those participants that reported uncertainties smaller than or equal to the median of all participants in compliance with CCPR-G2 Section 5.3.1 [4]. As an example of the effect of the cut-off, analysis of the comparison measurements has also been carried out without the cut-off. It was found that if no cut-off was applied, of the total of 468 degrees of equivalence, 6 extra points would be found inequivalent and 16 extra points would be found equivalent by the metric  $\frac{DoE}{U(DoE)} > 1$ . Interestingly, these points are scattered across many participants. The most dramatic shift is that one participant would gain 8 equivalences. Perhaps contrary to the intuitive expectation, this participant has declared uncertainties close to the median value, not low uncertainties. The shift from non-equivalent with cut-off to equivalent without cut-off is in this case due to a *reduced* weighting, which in turn increases the uncertainty in their DoE. This occurs because the correlation between their measurement and the KCRV decreases with decreased weighting and,

therefore, when the difference is taken between their measurement and the KCRV, the uncertainty is higher.

## Acknowledgements

John Hamlin's tireless measurements at MSL of filters and their characteristics are gratefully acknowledged. Thanks are also due to all of the participants for their timely responses to communications and submissions of measurement results. Many thanks also to Peter Saunders for his careful independent checks of the calculations contributing to the final report.

## References

- [1] CCPR, Report to the CIPM of the 19<sup>th</sup> meeting of the CCPR, June 2007.
- [2] G. Obein and J. Bastie, Report on the CCPR Key Comparison K6, September 2008 available at [http://kcdb.bipm.org/appendixB/appbresults/ccpr-k6/ccpr-k6\\_final\\_report.pdf](http://kcdb.bipm.org/appendixB/appbresults/ccpr-k6/ccpr-k6_final_report.pdf)
- [3] A. Koo and J. Hamlin (2012) *Metrologia* **49** S68
- [4] CCPR WG-KC, CCPR-G2 Guidelines for CCPR Key Comparison Report Preparation (2013).
- [5] J. F. Clare, A. Koo, and R. B. Davies (2014) *Communications in Statistics - Theory and Methods*. **43** (20) 4297-4307
- [6] E. Woolliams, M. Cox, N. Fox and P. Harris, CIPM Key Comparison K1-a Final Report January 2006 available at [http://kcdb.bipm.org/appendixB/appbresults/ccpr-k1.a/ccpr-k1.a\\_final\\_report.pdf](http://kcdb.bipm.org/appendixB/appbresults/ccpr-k1.a/ccpr-k1.a_final_report.pdf)

## **Appendix A – Technical Protocol**

This appendix can be found in the extra downloads available with this report.

## **Appendix B – Filter Stability**

These two reports can be found in the extra downloads available with this report.

## **Appendix C – Temperature Coefficients**

This appendix can be found in the extra downloads available with this report.

## **Appendix D - Participants' Reports**

Participants have all submitted reports which include the changes made during the pre-draft A process and in which all of the filter identifiers have been removed. These reports can be found in the extra downloads available with this report.

## **Appendix E – Pre-Draft A Notes to Participants**

This appendix can be found in the extra downloads available with this report.

## **Appendix F – Changes by Participants**

This appendix can be found in the extra downloads available with this report.

## **Appendix G – Uncertainty Budgets of all Participants**

This appendix can be found in the extra downloads available with this report.

## **Appendix H – Relative Data for all Participants**

This appendix can be found in the extra downloads available with this report.

## **Appendix I – Reported Values from all Participants**

This appendix contains two sets of data – one set of files show the measurements submitted by the participants apart from the pilot, the other set of files show the measurements submitted by the pilot on the same filters, labelled by participant and all are included in this report (see below).

## **Appendix J – Analysis Options**

This appendix can be found in the extra downloads available with this report.

## **Appendix K – Alternative Methods' Effect on DoEs**

This appendix can be found in the extra downloads available with this report.

## **Appendix L – Weights used to Find Solution**

This appendix is included in this report (see below).

## **Appendix M – Covariances Required for RMO Comparisons**

This appendix is included in this report (see below).

## **Appendix N – Relative Degrees of Equivalence**

This appendix can be found in the extra downloads available with this report.

## Reported Data for ASTAR

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1333e-01	9.1453e-01	9.1759e-01	9.1883e-01	9.1964e-01	9.2051e-01	9.2081e-01	9.2162e-01
<b>Uncertainty, Step 2</b>	3.15e-04	3.41e-04	2.98e-04	3.17e-04	2.96e-04	3.25e-04	3.15e-04	3.39e-04
<b>Value, Step 4</b>	9.1363e-01	9.1512e-01	9.1776e-01	9.1909e-01	9.2009e-01	9.2079e-01	9.2129e-01	9.2255e-01
<b>Uncertainty, Step 4</b>	3.05e-04	3.10e-04	3.73e-04	4.22e-04	4.79e-04	3.15e-04	3.55e-04	5.00e-04
<b>Covariance</b>	3.90e-08	3.90e-08	3.90e-08	3.90e-08	3.90e-08	3.90e-08	3.90e-08	3.90e-08
<b>Correlation Coefficient</b>	0.41	0.37	0.35	0.29	0.28	0.38	0.35	0.23

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0666e-01	6.0602e-01	6.2034e-01	6.0828e-01	6.3580e-01	5.7512e-01	4.9997e-01	4.5156e-01
<b>Uncertainty, Step 2</b>	1.30e-03	2.62e-04	2.40e-04	2.31e-04	2.56e-04	2.43e-04	2.01e-04	2.25e-04
<b>Value, Step 4</b>	4.0698e-01	6.0659e-01	6.2086e-01	6.0884e-01	6.3638e-01	5.7555e-01	5.0030e-01	4.5172e-01
<b>Uncertainty, Step 4</b>	1.30e-03	2.62e-04	2.40e-04	2.22e-04	2.65e-04	2.38e-04	3.70e-04	1.63e-04
<b>Covariance</b>	8.25e-07	2.35e-08	1.98e-08	2.31e-08	2.48e-08	2.14e-08	1.46e-08	1.12e-08
<b>Correlation Coefficient</b>	0.49	0.34	0.34	0.45	0.37	0.37	0.20	0.31

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1442e-02	9.4841e-02	9.1554e-02	7.6700e-02	1.6052e-01	1.4966e-01	1.0253e-01	7.6266e-02
<b>Uncertainty, Step 2</b>	2.61e-04	1.26e-04	6.10e-05	6.10e-05	1.63e-04	8.60e-05	6.60e-05	5.80e-05
<b>Value, Step 4</b>	2.1387e-02	9.4808e-02	9.1527e-02	7.6699e-02	1.6053e-01	1.4961e-01	1.0248e-01	7.6237e-02
<b>Uncertainty, Step 4</b>	2.61e-04	1.26e-04	6.50e-05	7.40e-05	1.68e-04	9.50e-05	8.40e-05	6.60e-05
<b>Covariance</b>	3.49e-08	8.79e-09	2.48e-09	3.10e-09	1.43e-08	3.71e-09	2.33e-09	1.55e-09
<b>Correlation Coefficient</b>	0.51	0.55	0.63	0.69	0.52	0.45	0.42	0.40



## Reported Data for ASTAR cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.5960e-04	5.1736e-03	8.4305e-03	8.3527e-03	2.6482e-02	3.2234e-02	2.2523e-02	1.6676e-02
<b>Uncertainty, Step 2</b>	1.13e-05	1.55e-05	9.90e-06	1.12e-05	5.18e-05	2.99e-05	2.16e-05	1.44e-05
<b>Value, Step 4</b>	3.5900e-04	5.1745e-03	8.4350e-03	8.3583e-03	2.6503e-02	3.2226e-02	2.2502e-02	1.6663e-02
<b>Uncertainty, Step 4</b>	8.60e-06	1.58e-05	1.02e-05	1.55e-05	5.25e-05	2.97e-05	2.54e-05	2.16e-05
<b>Covariance</b>	3.82e-11	1.38e-10	6.21e-11	1.05e-10	1.42e-09	4.33e-10	2.22e-10	1.18e-10
<b>Correlation Coefficient</b>	0.39	0.57	0.61	0.60	0.52	0.49	0.40	0.38

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.1730e-05	3.2304e-04	9.0833e-04	9.7493e-04	4.9398e-03	9.5005e-03	8.2898e-03	7.0015e-03
<b>Uncertainty, Step 2</b>	4.60e-07	1.44e-06	1.61e-06	1.79e-06	1.38e-05	1.01e-05	8.32e-06	8.10e-06
<b>Value, Step 4</b>	1.1850e-05	3.2435e-04	9.0756e-04	9.7391e-04	4.9324e-03	9.4869e-03	8.2563e-03	6.9839e-03
<b>Uncertainty, Step 4</b>	3.90e-07	1.42e-06	1.64e-06	1.96e-06	1.42e-05	1.02e-05	1.13e-05	1.04e-05
<b>Covariance</b>	7.78e-14	1.16e-12	1.35e-12	2.75e-12	1.01e-10	5.48e-11	3.36e-11	2.17e-11
<b>Correlation Coefficient</b>	0.43	0.57	0.51	0.78	0.52	0.53	0.36	0.26

## Reported Data for KRISS

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1348e-01	9.1478e-01	9.1703e-01	9.1882e-01	9.1984e-01	9.2061e-01	9.2091e-01	9.2112e-01
<b>Uncertainty, Step 2</b>	1.43e-03	1.56e-03	1.63e-03	1.35e-03	1.39e-03	1.20e-03	1.29e-03	1.28e-03
<b>Value, Step 4</b>	9.1317e-01	9.1450e-01	9.1713e-01	9.1868e-01	9.1977e-01	9.2035e-01	9.2079e-01	9.2072e-01
<b>Uncertainty, Step 4</b>	3.08e-03	1.48e-03	2.05e-03	1.37e-03	1.27e-03	1.26e-03	1.40e-03	1.97e-03
<b>Covariance</b>	1.68e-06	1.53e-06	1.30e-06	1.32e-06	1.27e-06	1.27e-06	1.33e-06	1.28e-06
<b>Correlation Coefficient</b>	0.38	0.66	0.39	0.71	0.72	0.84	0.74	0.51

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.1269e-01	6.0765e-01	6.2135e-01	6.0914e-01	6.3683e-01	5.7587e-01	5.0060e-01	4.5212e-01
<b>Uncertainty, Step 2</b>	2.13e-03	1.15e-03	9.40e-04	8.24e-04	9.79e-04	1.17e-03	8.18e-04	7.15e-04
<b>Value, Step 4</b>	4.1273e-01	6.0740e-01	6.2144e-01	6.0919e-01	6.3671e-01	5.7595e-01	5.0052e-01	4.5230e-01
<b>Uncertainty, Step 4</b>	2.66e-03	1.77e-03	1.74e-03	1.42e-03	1.74e-03	2.68e-03	1.02e-03	2.49e-03
<b>Covariance</b>	3.53e-06	6.94e-07	6.61e-07	5.93e-07	6.64e-07	5.25e-07	4.79e-07	3.72e-07
<b>Correlation Coefficient</b>	0.62	0.34	0.40	0.51	0.39	0.17	0.57	0.21

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.2515e-02	9.5631e-02	9.1971e-02	7.7254e-02	1.6199e-01	1.5011e-01	1.0296e-01	7.6727e-02
<b>Uncertainty, Step 2</b>	4.46e-04	4.45e-04	1.73e-04	1.78e-04	3.33e-04	2.33e-04	1.75e-04	1.33e-04
<b>Value, Step 4</b>	2.2523e-02	9.5545e-02	9.2075e-02	7.7168e-02	1.6162e-01	1.5023e-01	1.0301e-01	7.6828e-02
<b>Uncertainty, Step 4</b>	4.62e-04	6.00e-04	2.44e-04	2.04e-04	6.11e-04	6.24e-04	3.21e-04	2.75e-04
<b>Covariance</b>	1.73e-07	5.77e-08	1.70e-08	1.90e-08	4.92e-08	4.04e-08	1.98e-08	1.49e-08
<b>Correlation Coefficient</b>	0.84	0.22	0.40	0.52	0.24	0.28	0.35	0.41

## Reported Data for KRISS cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.8876e-04	5.1905e-03	8.3944e-03	8.3322e-03	2.6594e-02	3.2160e-02	2.2484e-02	1.6656e-02
<b>Uncertainty, Step 2</b>	2.23e-05	4.20e-05	1.84e-05	2.92e-05	6.45e-05	5.15e-05	3.30e-05	3.05e-05
<b>Value, Step 4</b>	3.8669e-04	5.1718e-03	8.3909e-03	8.3166e-03	2.6514e-02	3.2148e-02	2.2488e-02	1.6654e-02
<b>Uncertainty, Step 4</b>	2.24e-05	5.79e-05	2.55e-05	3.61e-05	1.59e-04	6.51e-05	9.49e-05	5.05e-05
<b>Covariance</b>	4.86e-10	4.91e-10	2.49e-10	4.77e-10	1.75e-09	2.06e-09	8.10e-10	6.98e-10
<b>Correlation Coefficient</b>	0.97	0.20	0.53	0.45	0.17	0.62	0.26	0.45

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.2911e-05	3.2052e-04	8.8426e-04	9.5151e-04	4.8799e-03	9.3408e-03	8.1256e-03	6.8614e-03
<b>Uncertainty, Step 2</b>	1.07e-06	9.18e-06	2.94e-06	4.37e-06	1.47e-05	1.55e-05	1.33e-05	1.28e-05
<b>Value, Step 4</b>	1.2404e-05	3.1929e-04	8.8299e-04	9.4752e-04	4.8538e-03	9.3227e-03	8.1086e-03	6.8541e-03
<b>Uncertainty, Step 4</b>	2.10e-06	8.75e-06	5.94e-06	4.65e-06	2.21e-05	2.03e-05	3.78e-05	3.35e-05
<b>Covariance</b>	8.85e-13	5.77e-11	4.02e-12	9.75e-12	8.12e-11	1.63e-10	1.30e-10	1.28e-10
<b>Correlation Coefficient</b>	0.39	0.72	0.23	0.48	0.25	0.52	0.26	0.30

## Reported Data for LNE-CNAM

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1270e-01	9.1440e-01	9.1710e-01	9.1840e-01	9.1940e-01	9.2030e-01	9.2050e-01	9.2090e-01
<b>Uncertainty, Step 2</b>	5.00e-04	2.00e-04	2.00e-04	2.00e-04	1.00e-04	1.00e-04	2.00e-04	2.00e-04
<b>Value, Step 4</b>	9.1250e-01	9.1420e-01	9.1680e-01	9.1820e-01	9.1960e-01	9.2020e-01	9.2060e-01	9.2120e-01
<b>Uncertainty, Step 4</b>	4.00e-04	2.00e-04	2.00e-04	1.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04
<b>Covariance</b>	1.31e-08	4.78e-09	4.71e-09	4.73e-09	4.69e-09	4.69e-09	4.69e-09	7.12e-09
<b>Correlation Coefficient</b>	0.07	0.12	0.12	0.24	0.23	0.23	0.12	0.18

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0940e-01	6.0750e-01	6.2160e-01	6.0950e-01	6.3720e-01	5.7670e-01	5.0170e-01	4.5330e-01
<b>Uncertainty, Step 2</b>	6.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	1.00e-04
<b>Value, Step 4</b>	4.0810e-01	6.0760e-01	6.2150e-01	6.0940e-01	6.3710e-01	5.7680e-01	5.0180e-01	4.5340e-01
<b>Uncertainty, Step 4</b>	5.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	2.00e-04	1.00e-04
<b>Covariance</b>	8.40e-09	1.37e-08	1.38e-08	1.37e-08	1.38e-08	1.35e-08	1.32e-08	7.15e-09
<b>Correlation Coefficient</b>	0.03	0.34	0.34	0.34	0.35	0.34	0.33	0.72

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1630e-02	9.5380e-02	9.1910e-02	7.7040e-02	1.6118e-01	1.4995e-01	1.0276e-01	7.6480e-02
<b>Uncertainty, Step 2</b>	1.10e-04	9.00e-05	8.00e-05	7.00e-05	1.40e-04	1.20e-04	9.00e-05	7.00e-05
<b>Value, Step 4</b>	2.1360e-02	9.5300e-02	9.1930e-02	7.7020e-02	1.6103e-01	1.4996e-01	1.0276e-01	7.6500e-02
<b>Uncertainty, Step 4</b>	1.10e-04	8.00e-05	8.00e-05	7.00e-05	1.40e-04	1.20e-04	9.00e-05	7.00e-05
<b>Covariance</b>	4.51e-10	5.61e-09	5.24e-09	3.77e-09	1.46e-08	1.22e-08	6.47e-09	3.76e-09
<b>Correlation Coefficient</b>	0.04	0.78	0.82	0.77	0.74	0.85	0.80	0.77

## Reported Data for LNE-CNAM cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.9850e-04	5.4860e-03	8.8580e-03	8.7620e-03	2.7520e-02	3.3370e-02	2.3430e-02	1.7390e-02
<b>Uncertainty, Step 2</b>	6.00e-06	8.00e-06	1.20e-05	1.20e-05	2.90e-05	3.50e-05	3.00e-05	2.30e-05
<b>Value, Step 4</b>	3.8910e-04	5.4680e-03	8.8570e-03	8.7510e-03	2.7470e-02	3.3360e-02	2.3420e-02	1.7390e-02
<b>Uncertainty, Step 4</b>	6.00e-06	8.00e-06	1.20e-05	1.20e-05	2.80e-05	3.50e-05	2.90e-05	2.20e-05
<b>Covariance</b>	2.39e-12	3.90e-11	1.07e-10	1.05e-10	5.84e-10	8.70e-10	6.96e-10	4.10e-10
<b>Correlation Coefficient</b>	0.07	0.61	0.74	0.73	0.72	0.71	0.80	0.81

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.1500e-05	3.1000e-04	8.6700e-04	9.2800e-04	4.7670e-03	9.2040e-03	8.0140e-03	6.7570e-03
<b>Uncertainty, Step 2</b>	4.00e-07	1.10e-06	2.10e-06	2.30e-06	6.70e-06	1.40e-05	1.30e-05	1.10e-05
<b>Value, Step 4</b>	1.1400e-05	3.0800e-04	8.6600e-04	9.2500e-04	4.7520e-03	9.1890e-03	8.0100e-03	6.7580e-03
<b>Uncertainty, Step 4</b>	5.00e-07	1.20e-06	2.60e-06	2.30e-06	6.80e-06	1.40e-05	1.30e-05	1.10e-05
<b>Covariance</b>	1.67e-14	1.07e-12	3.37e-12	4.13e-12	3.30e-11	1.36e-10	1.23e-10	8.95e-11
<b>Correlation Coefficient</b>	0.08	0.81	0.62	0.78	0.72	0.69	0.73	0.74

## Reported Data for MKEH

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1450e-01	9.1560e-01	9.1890e-01	9.2110e-01	9.2270e-01	9.2400e-01	9.2440e-01	9.2480e-01
<b>Uncertainty, Step 2</b>	1.00e-03	9.00e-04	1.00e-03	9.00e-04	9.00e-04	1.00e-03	1.20e-03	1.40e-03
<b>Value, Step 4</b>	9.1010e-01	9.1050e-01	9.1290e-01	9.1390e-01	9.1660e-01	9.1720e-01	9.1940e-01	9.1950e-01
<b>Uncertainty, Step 4</b>	1.00e-03	9.00e-04	8.00e-04	8.00e-04	7.00e-04	9.00e-04	1.50e-03	1.70e-03
<b>Covariance</b>	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0880e-01	6.0850e-01	6.2280e-01	6.1110e-01	6.3900e-01	5.7860e-01	5.0270e-01	4.5360e-01
<b>Uncertainty, Step 2</b>	1.40e-03	4.60e-04	4.20e-04	4.20e-04	4.10e-04	4.00e-04	4.10e-04	4.20e-04
<b>Value, Step 4</b>	4.1370e-01	6.1010e-01	6.2390e-01	6.1220e-01	6.3980e-01	5.7930e-01	5.0330e-01	4.5410e-01
<b>Uncertainty, Step 4</b>	1.49e-03	6.30e-04	4.60e-04	4.60e-04	4.10e-04	5.30e-04	7.30e-04	4.20e-04
<b>Covariance</b>	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.0900e-02	9.3900e-02	9.0700e-02	7.5900e-02	1.5920e-01	1.4810e-01	1.0110e-01	7.5100e-02
<b>Uncertainty, Step 2</b>	7.39e-04	1.91e-04	1.90e-04	2.19e-04	5.07e-04	4.23e-04	2.70e-04	2.93e-04
<b>Value, Step 4</b>	2.1600e-02	9.4600e-02	9.1200e-02	7.6500e-02	1.6070e-01	1.4930e-01	1.0180e-01	7.5700e-02
<b>Uncertainty, Step 4</b>	7.51e-04	2.12e-04	2.36e-04	2.38e-04	5.01e-04	4.52e-04	2.09e-04	1.67e-04
<b>Covariance</b>	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Reported Data for MKEH cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.5000e-04	5.1500e-03	8.4300e-03	8.3500e-03	2.6580e-02	3.2300e-02	2.2480e-02	1.6560e-02
<b>Uncertainty, Step 2</b>	1.08e-05	2.80e-05	1.61e-05	2.18e-05	6.09e-05	8.63e-05	5.69e-05	4.96e-05
<b>Value, Step 4</b>	3.7000e-04	5.1500e-03	8.3800e-03	8.3100e-03	2.6470e-02	3.2080e-02	2.2320e-02	1.6480e-02
<b>Uncertainty, Step 4</b>	8.20e-06	2.39e-05	1.61e-05	2.16e-05	6.04e-05	5.53e-05	4.78e-05	3.71e-05
<b>Covariance</b>	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.3000e-05	3.4400e-04	9.6200e-04	1.0310e-03	5.1690e-03	9.8950e-03	8.6070e-03	7.2740e-03
<b>Uncertainty, Step 2</b>	8.10e-06	1.07e-05	7.10e-06	5.50e-06	2.09e-05	4.34e-05	2.08e-05	2.36e-05
<b>Value, Step 4</b>	1.2000e-05	3.4500e-04	9.5900e-04	1.0290e-03	5.1610e-03	9.8600e-03	8.5910e-03	7.2580e-03
<b>Uncertainty, Step 4</b>	1.70e-06	1.07e-05	7.10e-06	5.50e-06	2.09e-05	4.34e-05	2.08e-05	2.36e-05
<b>Covariance</b>	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00	0.00e+00
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Reported Data for NIST

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1177e-01	9.1364e-01	9.1682e-01	9.1874e-01	9.1998e-01	9.2079e-01	9.2143e-01	9.2199e-01
<b>Uncertainty, Step 2</b>	5.22e-04	5.24e-04	5.27e-04	5.29e-04	5.31e-04	5.32e-04	5.33e-04	5.33e-04
<b>Value, Step 4</b>	9.1241e-01	9.1418e-01	9.1707e-01	9.1881e-01	9.2003e-01	9.2079e-01	9.2134e-01	9.2202e-01
<b>Uncertainty, Step 4</b>	5.23e-04	5.24e-04	5.27e-04	5.29e-04	5.31e-04	5.32e-04	5.32e-04	5.33e-04
<b>Covariance</b>	1.81e-07	1.82e-07	1.85e-07	1.86e-07	1.87e-07	1.88e-07	1.88e-07	1.89e-07
<b>Correlation Coefficient</b>	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0954e-01	6.0823e-01	6.2223e-01	6.0986e-01	6.3734e-01	5.7664e-01	5.0142e-01	4.5293e-01
<b>Uncertainty, Step 2</b>	1.67e-03	9.65e-04	3.09e-04	1.87e-04	1.82e-04	1.81e-04	1.42e-04	1.00e-04
<b>Value, Step 4</b>	4.1353e-01	6.0783e-01	6.2173e-01	6.0960e-01	6.3708e-01	5.7646e-01	5.0128e-01	4.5283e-01
<b>Uncertainty, Step 4</b>	1.67e-03	9.65e-04	3.09e-04	1.87e-04	1.82e-04	1.81e-04	1.42e-04	1.01e-04
<b>Covariance</b>	1.53e-08	3.07e-08	2.90e-08	2.68e-08	3.20e-08	2.14e-08	1.23e-08	8.22e-09
<b>Correlation Coefficient</b>	0.01	0.03	0.30	0.77	0.96	0.65	0.60	0.81

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1654e-02	9.4948e-02	9.1705e-02	7.6857e-02	1.6070e-01	1.4980e-01	1.0264e-01	7.6400e-02
<b>Uncertainty, Step 2</b>	6.13e-04	3.51e-04	1.27e-04	8.49e-05	7.07e-05	6.42e-05	5.94e-05	1.93e-05
<b>Value, Step 4</b>	2.2510e-02	9.5054e-02	9.1657e-02	7.6840e-02	1.6061e-01	1.4979e-01	1.0264e-01	7.6415e-02
<b>Uncertainty, Step 4</b>	6.13e-04	3.51e-04	1.27e-04	8.48e-05	7.07e-05	6.43e-05	5.95e-05	1.95e-05
<b>Covariance</b>	8.78e-12	2.22e-11	1.45e-11	7.60e-12	1.36e-10	1.18e-10	2.22e-11	7.55e-12
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.03	0.03	0.01	0.02



## Reported Data for NIST cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0281e-04	5.1617e-03	8.3973e-03	8.3104e-03	2.6411e-02	3.2147e-02	2.2478e-02	1.6623e-02
<b>Uncertainty, Step 2</b>	4.62e-05	3.24e-05	1.51e-05	1.95e-05	2.59e-05	1.62e-05	2.08e-05	1.48e-05
<b>Value, Step 4</b>	4.1380e-04	5.1715e-03	8.3937e-03	8.3073e-03	2.6380e-02	3.2139e-02	2.2481e-02	1.6638e-02
<b>Uncertainty, Step 4</b>	4.62e-05	3.24e-05	1.51e-05	1.95e-05	2.59e-05	1.62e-05	2.08e-05	1.48e-05
<b>Covariance</b>	1.14e-13	1.19e-13	1.25e-13	1.25e-13	1.27e-12	2.65e-12	7.19e-13	2.94e-13
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.8480e-05	3.5908e-04	9.8757e-04	1.0574e-03	5.2499e-03	1.0015e-02	8.7339e-03	7.3962e-03
<b>Uncertainty, Step 2</b>	2.69e-05	2.11e-05	1.33e-05	1.35e-05	1.54e-05	1.39e-05	1.41e-05	1.38e-05
<b>Value, Step 4</b>	3.6300e-05	3.6064e-04	9.8826e-04	1.0573e-03	5.2404e-03	1.0007e-02	8.7327e-03	7.3900e-03
<b>Uncertainty, Step 4</b>	2.69e-05	2.11e-05	1.33e-05	1.35e-05	1.54e-05	1.39e-05	1.41e-05	1.38e-05
<b>Covariance</b>	1.98e-14	1.98e-14	1.98e-14	1.98e-14	3.18e-14	1.78e-13	1.11e-13	6.67e-14
<b>Correlation Coefficient</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Reported Data for NMIJ

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1350e-01	9.1470e-01	9.1690e-01	9.1800e-01	9.1920e-01	9.1970e-01	9.2040e-01	9.2080e-01
<b>Uncertainty, Step 2</b>	5.40e-04	5.30e-04	3.30e-04	3.30e-04	3.30e-04	3.40e-04	3.30e-04	3.20e-04
<b>Value, Step 4</b>	9.1420e-01	9.1560e-01	9.1750e-01	9.1870e-01	9.1970e-01	9.2020e-01	9.2080e-01	9.2130e-01
<b>Uncertainty, Step 4</b>	5.30e-04	5.20e-04	3.40e-04	3.30e-04	3.30e-04	3.50e-04	3.30e-04	3.30e-04
<b>Covariance</b>	4.64e-08	4.56e-08	4.58e-08	4.59e-08	4.58e-08	4.58e-08	4.97e-08	4.58e-08
<b>Correlation Coefficient</b>	0.16	0.17	0.41	0.42	0.42	0.39	0.46	0.43

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.1250e-01	6.0830e-01	6.2200e-01	6.0990e-01	6.3740e-01	5.7690e-01	5.0170e-01	4.5320e-01
<b>Uncertainty, Step 2</b>	9.50e-04	3.60e-04	2.90e-04	2.90e-04	3.00e-04	3.00e-04	2.50e-04	2.20e-04
<b>Value, Step 4</b>	4.1320e-01	6.0850e-01	6.2230e-01	6.1020e-01	6.3760e-01	5.7700e-01	5.0170e-01	4.5340e-01
<b>Uncertainty, Step 4</b>	9.50e-04	3.80e-04	2.80e-04	2.70e-04	2.80e-04	2.80e-04	2.40e-04	2.00e-04
<b>Covariance</b>	8.21e-07	4.42e-08	4.51e-08	3.93e-08	4.63e-08	5.19e-08	3.73e-08	2.28e-08
<b>Correlation Coefficient</b>	0.91	0.32	0.56	0.50	0.55	0.62	0.62	0.52

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.2440e-02	9.5810e-02	9.2630e-02	7.7610e-02	1.6210e-01	1.5090e-01	1.0330e-01	7.6990e-02
<b>Uncertainty, Step 2</b>	2.50e-04	1.40e-04	1.00e-04	7.90e-05	2.50e-04	1.60e-04	9.90e-05	8.00e-05
<b>Value, Step 4</b>	2.2570e-02	9.5940e-02	9.2500e-02	7.7550e-02	1.6230e-01	1.5090e-01	1.0330e-01	7.6950e-02
<b>Uncertainty, Step 4</b>	2.50e-04	1.00e-04	1.30e-04	1.00e-04	2.90e-04	2.00e-04	1.30e-04	6.60e-05
<b>Covariance</b>	5.73e-08	6.74e-09	3.48e-09	1.35e-09	4.36e-08	7.57e-09	1.86e-09	1.35e-09
<b>Correlation Coefficient</b>	0.92	0.48	0.27	0.17	0.60	0.24	0.14	0.26

## Reported Data for NMIJ cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0440e-04	5.4540e-03	8.8420e-03	8.7470e-03	2.7630e-02	3.3460e-02	2.3540e-02	1.7400e-02
<b>Uncertainty, Step 2</b>	1.80e-05	4.20e-05	4.40e-05	3.60e-05	1.10e-04	1.10e-04	9.60e-05	4.60e-05
<b>Value, Step 4</b>	4.3480e-04	5.5160e-03	8.9070e-03	8.8110e-03	2.7660e-02	3.3430e-02	2.3590e-02	1.7500e-02
<b>Uncertainty, Step 4</b>	1.70e-05	4.30e-05	2.60e-05	2.10e-05	8.70e-05	8.70e-05	8.10e-05	4.60e-05
<b>Covariance</b>	1.69e-10	6.21e-10	1.19e-10	1.46e-10	3.30e-09	1.53e-09	3.56e-09	4.08e-10
<b>Correlation Coefficient</b>	0.55	0.34	0.10	0.19	0.34	0.16	0.46	0.19

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.2470e-05	3.2570e-04	9.0730e-04	9.8830e-04	4.9560e-03	9.5250e-03	8.3700e-03	6.9530e-03
<b>Uncertainty, Step 2</b>	6.60e-06	7.90e-06	7.70e-06	8.30e-06	5.90e-05	6.50e-05	6.20e-05	9.40e-05
<b>Value, Step 4</b>	1.3820e-05	3.2920e-04	9.2000e-04	9.9560e-04	5.0500e-03	9.6020e-03	8.3450e-03	7.0550e-03
<b>Uncertainty, Step 4</b>	3.50e-06	5.70e-06	7.00e-06	7.60e-06	2.90e-05	5.00e-05	5.00e-05	3.60e-05
<b>Covariance</b>	5.34e-12	7.67e-12	1.03e-11	1.18e-11	3.75e-10	8.65e-10	1.23e-09	4.79e-10
<b>Correlation Coefficient</b>	0.23	0.17	0.19	0.19	0.22	0.27	0.40	0.14

## Reported Data for NMISA

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1220e-01	9.1440e-01	9.1560e-01	9.1730e-01	9.1800e-01	9.1800e-01	9.2470e-01	9.2510e-01
<b>Uncertainty, Step 2</b>	4.02e-03	4.71e-03	4.19e-03	4.11e-03	4.08e-03	5.03e-03	1.44e-02	2.15e-02
<b>Value, Step 4</b>	9.1190e-01	9.1400e-01	9.1450e-01	9.1680e-01	9.1710e-01	9.1920e-01	9.0380e-01	9.2470e-01
<b>Uncertainty, Step 4</b>	4.03e-03	4.48e-03	4.32e-03	4.17e-03	4.20e-03	5.11e-03	2.18e-02	2.27e-02
<b>Covariance</b>	1.34e-05	1.90e-05	1.67e-05	1.65e-05	1.63e-05	2.49e-05	2.02e-04	4.55e-04
<b>Correlation Coefficient</b>	0.82	0.90	0.92	0.96	0.95	0.97	0.64	0.93

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0850e-01	6.0800e-01	6.2170e-01	6.0930e-01	6.3650e-01	5.7670e-01	5.1850e-01	4.7010e-01
<b>Uncertainty, Step 2</b>	4.02e-03	4.46e-03	4.15e-03	4.12e-03	4.11e-03	5.06e-03	1.44e-02	2.15e-02
<b>Value, Step 4</b>	4.1050e-01	6.0740e-01	6.2050e-01	6.0940e-01	6.3650e-01	5.7650e-01	5.1510e-01	4.5660e-01
<b>Uncertainty, Step 4</b>	4.21e-03	4.53e-03	4.33e-03	4.20e-03	4.07e-03	5.03e-03	1.86e-02	2.18e-02
<b>Covariance</b>	1.34e-05	1.92e-05	1.67e-05	1.67e-05	1.63e-05	2.50e-05	2.02e-04	4.56e-04
<b>Correlation Coefficient</b>	0.79	0.95	0.93	0.96	0.98	0.98	0.76	0.97

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1100e-02	9.4400e-02	9.1100e-02	7.6100e-02	1.5920e-01	1.4890e-01	1.0820e-01	8.1000e-02
<b>Uncertainty, Step 2</b>	6.49e-03	4.67e-03	4.28e-03	4.81e-03	4.19e-03	5.06e-03	1.44e-02	2.15e-02
<b>Value, Step 4</b>	2.1700e-02	9.4700e-02	9.0900e-02	7.6300e-02	1.5960e-01	1.4880e-01	1.0850e-01	7.7200e-02
<b>Uncertainty, Step 4</b>	6.04e-03	4.71e-03	4.34e-03	4.61e-03	4.17e-03	5.09e-03	6.54e-02	6.12e-02
<b>Covariance</b>	1.38e-05	2.13e-05	1.72e-05	2.08e-05	1.70e-05	2.51e-05	2.02e-04	4.55e-04
<b>Correlation Coefficient</b>	0.35	0.97	0.92	0.94	0.97	0.97	0.21	0.35

## Reported Data for NMISA cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.0000e-04	5.1000e-03	8.3000e-03	8.2000e-03	2.6000e-02	3.1900e-02	2.3900e-02	1.7600e-02
<b>Uncertainty, Step 2</b>	4.25e-03	8.31e-03	4.35e-03	6.59e-03	4.92e-03	5.34e-03	1.50e-02	2.18e-02
<b>Value, Step 4</b>	4.0000e-04	5.1000e-03	8.3000e-03	8.2000e-03	2.6200e-02	3.1900e-02	2.4800e-02	1.5200e-02
<b>Uncertainty, Step 4</b>	6.90e-02	1.39e-02	7.84e-03	8.43e-03	4.96e-03	6.97e-03	3.98e-01	1.74e-01
<b>Covariance</b>	1.83e-05	4.03e-05	1.92e-05	3.39e-05	2.06e-05	2.59e-05	2.74e-04	4.84e-04
<b>Correlation Coefficient</b>	0.06	0.35	0.56	0.61	0.84	0.70	0.05	0.13

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 2</b>	-	-	-	-	-	-	-	-
<b>Value, Step 4</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 4</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	-	-	-	-	-	-	-	-
<b>Correlation Coefficient</b>	-	-	-	-	-	-	-	-

## Reported Data for NPL

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1299e-01	9.1455e-01	9.1706e-01	9.1848e-01	9.1921e-01	9.2033e-01	9.2068e-01	9.2119e-01
<b>Uncertainty, Step 2</b>	1.84e-04	1.79e-04	1.71e-04	1.59e-04	1.69e-04	1.57e-04	1.51e-04	1.54e-04
<b>Value, Step 4</b>	9.1285e-01	9.1462e-01	9.1704e-01	9.1850e-01	9.1948e-01	9.2025e-01	9.2063e-01	9.2102e-01
<b>Uncertainty, Step 4</b>	1.81e-04	1.79e-04	1.69e-04	1.58e-04	1.65e-04	1.49e-04	1.52e-04	1.51e-04
<b>Covariance</b>	1.98e-08	1.89e-08	1.88e-08	1.89e-08	1.89e-08	1.89e-08	1.88e-08	1.87e-08
<b>Correlation Coefficient</b>	0.59	0.59	0.65	0.75	0.68	0.81	0.82	0.81

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0714e-01	6.0721e-01	6.2077e-01	6.0848e-01	6.3583e-01	5.7517e-01	4.9981e-01	4.5136e-01
<b>Uncertainty, Step 2</b>	9.94e-04	2.09e-04	1.76e-04	1.33e-04	1.37e-04	1.69e-04	1.36e-04	1.01e-04
<b>Value, Step 4</b>	4.0711e-01	6.0709e-01	6.2053e-01	6.0840e-01	6.3593e-01	5.7497e-01	4.9965e-01	4.5119e-01
<b>Uncertainty, Step 4</b>	9.86e-04	2.12e-04	1.76e-04	1.33e-04	1.35e-04	1.69e-04	1.37e-04	1.00e-04
<b>Covariance</b>	9.12e-07	2.67e-08	1.28e-08	1.22e-08	1.38e-08	1.80e-08	1.16e-08	6.39e-09
<b>Correlation Coefficient</b>	0.93	0.60	0.41	0.69	0.74	0.63	0.62	0.63

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1496e-02	9.5668e-02	9.2044e-02	7.7085e-02	1.6136e-01	1.5011e-01	1.0281e-01	7.6531e-02
<b>Uncertainty, Step 2</b>	2.59e-04	1.08e-04	4.56e-05	2.78e-05	1.52e-04	6.66e-05	4.92e-05	2.56e-05
<b>Value, Step 4</b>	2.1550e-02	9.5618e-02	9.1993e-02	7.7058e-02	1.6138e-01	1.5005e-01	1.0276e-01	7.6496e-02
<b>Uncertainty, Step 4</b>	2.60e-04	1.13e-04	4.88e-05	3.25e-05	1.55e-04	7.27e-05	5.19e-05	2.69e-05
<b>Covariance</b>	6.62e-08	1.17e-08	2.01e-09	9.16e-10	2.39e-08	4.56e-09	2.11e-09	5.56e-10
<b>Correlation Coefficient</b>	0.98	0.96	0.90	1.01	1.01	0.94	0.83	0.81

## Reported Data for NPL cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.9133e-04	5.3736e-03	8.6947e-03	8.6000e-03	2.7136e-02	3.2955e-02	2.3098e-02	1.7138e-02
<b>Uncertainty, Step 2</b>	1.90e-05	1.85e-05	4.94e-06	6.40e-06	3.68e-05	1.62e-05	1.30e-05	6.53e-06
<b>Value, Step 4</b>	3.6812e-04	5.3725e-03	8.6949e-03	8.6000e-03	2.7146e-02	3.2944e-02	2.3095e-02	1.7131e-02
<b>Uncertainty, Step 4</b>	1.60e-05	1.92e-05	4.70e-06	6.25e-06	3.67e-05	1.59e-05	1.29e-05	7.20e-06
<b>Covariance</b>	7.15e-11	3.08e-10	1.69e-11	3.48e-11	1.32e-09	1.79e-10	1.36e-10	3.55e-11
<b>Correlation Coefficient</b>	0.24	0.87	0.73	0.87	0.97	0.70	0.81	0.76

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	-	3.4968e-04	9.6411e-04	1.0308e-03	5.1582e-03	9.8744e-03	8.6137e-03	7.2887e-03
<b>Uncertainty, Step 2</b>	-	6.34e-06	2.36e-06	1.39e-06	9.90e-06	6.33e-06	4.58e-06	3.60e-06
<b>Value, Step 4</b>	-	3.4290e-04	9.6232e-04	1.0308e-03	5.1610e-03	9.8706e-03	8.6122e-03	7.2835e-03
<b>Uncertainty, Step 4</b>	-	6.35e-06	9.75e-07	1.14e-06	9.90e-06	4.81e-06	4.33e-06	3.61e-06
<b>Covariance</b>	-	4.25e-12	3.62e-13	1.02e-12	9.46e-11	1.74e-11	1.64e-11	8.01e-12
<b>Correlation Coefficient</b>	-	0.11	0.16	0.64	0.96	0.57	0.83	0.62

## Reported Data for NRC

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1264e-01	9.1432e-01	9.1663e-01	9.1820e-01	9.1938e-01	9.2016e-01	9.2053e-01	9.2087e-01
<b>Uncertainty, Step 2</b>	1.51e-04	1.37e-04	1.28e-04	1.14e-04	1.08e-04	1.15e-04	1.11e-04	1.37e-04
<b>Value, Step 4</b>	9.1166e-01	9.1338e-01	9.1582e-01	9.1747e-01	9.1861e-01	9.1948e-01	9.1991e-01	9.2023e-01
<b>Uncertainty, Step 4</b>	1.18e-04	1.05e-04	8.19e-05	8.66e-05	8.78e-05	8.92e-05	6.91e-05	8.55e-05
<b>Covariance</b>	8.78e-09	7.08e-09	4.81e-09	5.70e-09	5.86e-09	5.90e-09	3.21e-09	5.53e-09
<b>Correlation Coefficient</b>	0.49	0.49	0.46	0.58	0.62	0.58	0.42	0.47

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0964e-01	6.0978e-01	6.2310e-01	6.1097e-01	6.3846e-01	5.7810e-01	5.0310e-01	4.5463e-01
<b>Uncertainty, Step 2</b>	2.17e-04	1.29e-04	1.01e-04	8.41e-05	9.29e-05	8.96e-05	8.70e-05	7.92e-05
<b>Value, Step 4</b>	4.0959e-01	6.0959e-01	6.2297e-01	6.1093e-01	6.3829e-01	5.7785e-01	5.0275e-01	4.5440e-01
<b>Uncertainty, Step 4</b>	1.97e-04	7.31e-05	6.30e-05	6.62e-05	7.21e-05	8.10e-05	8.72e-05	7.10e-05
<b>Covariance</b>	2.92e-08	3.46e-09	3.33e-09	3.85e-09	3.82e-09	4.38e-09	3.67e-09	2.96e-09
<b>Correlation Coefficient</b>	0.68	0.37	0.52	0.69	0.57	0.60	0.48	0.53

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1650e-02	9.6410e-02	9.2900e-02	7.7850e-02	1.6254e-01	1.5130e-01	1.0374e-01	7.7260e-02
<b>Uncertainty, Step 2</b>	9.62e-05	8.58e-05	6.11e-05	2.27e-05	8.63e-05	4.69e-05	3.09e-05	1.82e-05
<b>Value, Step 4</b>	2.1640e-02	9.6410e-02	9.2900e-02	7.7870e-02	1.6247e-01	1.5123e-01	1.0366e-01	7.7220e-02
<b>Uncertainty, Step 4</b>	9.41e-05	8.19e-05	6.05e-05	2.25e-05	8.81e-05	4.46e-05	3.08e-05	1.75e-05
<b>Covariance</b>	7.61e-09	6.08e-09	3.56e-09	4.45e-10	7.18e-09	1.78e-09	8.35e-10	2.84e-10
<b>Correlation Coefficient</b>	0.84	0.87	0.96	0.87	0.94	0.85	0.88	0.89



## Reported Data for NRC cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.5240e-04	5.1460e-03	8.3730e-03	8.2820e-03	2.6360e-02	3.2090e-02	2.2440e-02	1.6600e-02
<b>Uncertainty, Step 2</b>	1.60e-06	8.71e-06	6.36e-06	5.22e-06	1.93e-05	9.39e-06	7.66e-06	4.59e-06
<b>Value, Step 4</b>	3.5300e-04	5.1390e-03	8.3650e-03	8.2750e-03	2.6340e-02	3.2050e-02	2.2410e-02	1.6580e-02
<b>Uncertainty, Step 4</b>	2.06e-06	8.83e-06	6.19e-06	4.95e-06	1.90e-05	1.14e-05	8.11e-06	4.95e-06
<b>Covariance</b>	1.82e-12	7.13e-11	3.63e-11	2.35e-11	3.41e-10	2.39e-11	2.86e-11	6.48e-12
<b>Correlation Coefficient</b>	0.55	0.93	0.92	0.91	0.93	0.22	0.46	0.29

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.2400e-05	3.3480e-04	9.3040e-04	9.9490e-04	5.0180e-03	9.6400e-03	8.4190e-03	7.1110e-03
<b>Uncertainty, Step 2</b>	1.27e-07	4.17e-07	6.13e-07	5.71e-07	5.21e-06	5.07e-06	5.71e-06	3.57e-06
<b>Value, Step 4</b>	1.2490e-05	3.3390e-04	9.3020e-04	9.9510e-04	5.0190e-03	9.6400e-03	8.4160e-03	7.1100e-03
<b>Uncertainty, Step 4</b>	9.45e-08	8.85e-07	5.89e-07	5.56e-07	5.18e-06	4.94e-06	5.42e-06	2.68e-06
<b>Covariance</b>	8.46e-16	3.24e-14	1.32e-13	2.17e-13	2.54e-11	2.04e-11	8.71e-12	3.39e-12
<b>Correlation Coefficient</b>	0.07	0.09	0.37	0.68	0.94	0.82	0.28	0.35

## Reported Data for PTB

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1299e-01	9.1466e-01	9.1709e-01	9.1852e-01	9.1957e-01	9.2038e-01	9.2087e-01	9.2124e-01
<b>Uncertainty, Step 2</b>	3.65e-04	3.28e-04	3.02e-04	3.09e-04	3.16e-04	3.25e-04	3.22e-04	3.16e-04
<b>Value, Step 4</b>	9.1316e-01	9.1478e-01	9.1729e-01	9.1873e-01	9.1979e-01	9.2056e-01	9.2111e-01	9.2136e-01
<b>Uncertainty, Step 4</b>	3.23e-04	3.12e-04	3.03e-04	3.03e-04	3.12e-04	3.29e-04	3.16e-04	3.18e-04
<b>Covariance</b>	7.89e-08	7.94e-08	7.94e-08	7.98e-08	7.98e-08	7.98e-08	8.02e-08	8.24e-08
<b>Correlation Coefficient</b>	0.67	0.78	0.87	0.85	0.81	0.75	0.79	0.82

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0747e-01	6.0800e-01	6.2132e-01	6.0898e-01	6.3653e-01	5.7580e-01	5.0044e-01	4.5177e-01
<b>Uncertainty, Step 2</b>	3.14e-04	1.82e-04	1.54e-04	1.52e-04	1.68e-04	1.95e-04	1.37e-04	2.03e-04
<b>Value, Step 4</b>	4.0738e-01	6.0779e-01	6.2124e-01	6.0900e-01	6.3649e-01	5.7567e-01	5.0039e-01	4.5165e-01
<b>Uncertainty, Step 4</b>	4.61e-04	2.10e-04	1.96e-04	1.75e-04	1.61e-04	2.06e-04	1.25e-04	2.27e-04
<b>Covariance</b>	4.78e-09	1.40e-08	1.47e-08	1.42e-08	1.60e-08	1.22e-08	8.51e-09	3.48e-08
<b>Correlation Coefficient</b>	0.03	0.37	0.49	0.53	0.59	0.30	0.50	0.75

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1226e-02	9.4780e-02	9.1276e-02	7.6401e-02	1.6029e-01	1.4930e-01	1.0222e-01	7.5966e-02
<b>Uncertainty, Step 2</b>	4.77e-05	4.81e-05	2.01e-05	1.95e-05	4.85e-05	3.77e-05	2.45e-05	4.79e-05
<b>Value, Step 4</b>	2.1263e-02	9.4810e-02	9.1274e-02	7.6404e-02	1.6031e-01	1.4929e-01	1.0223e-01	7.5967e-02
<b>Uncertainty, Step 4</b>	4.54e-05	4.23e-05	1.97e-05	1.92e-05	4.20e-05	4.21e-05	2.14e-05	4.67e-05
<b>Covariance</b>	6.19e-11	9.73e-10	1.88e-10	1.97e-10	6.25e-10	5.07e-10	2.29e-10	2.00e-09
<b>Correlation Coefficient</b>	0.03	0.48	0.47	0.53	0.31	0.32	0.44	0.89

## Reported Data for PTB cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	3.3686e-04	4.9653e-03	8.1146e-03	8.0214e-03	2.5727e-02	3.1361e-02	2.1862e-02	1.6135e-02
<b>Uncertainty, Step 2</b>	1.23e-06	6.29e-06	8.20e-06	1.22e-05	2.36e-05	2.75e-05	1.78e-05	1.47e-05
<b>Value, Step 4</b>	3.3783e-04	4.9715e-03	8.1167e-03	8.0233e-03	2.5728e-02	3.1363e-02	2.1851e-02	1.6135e-02
<b>Uncertainty, Step 4</b>	1.20e-06	4.10e-06	4.83e-06	1.08e-05	1.25e-05	1.56e-05	1.60e-05	1.39e-05
<b>Covariance</b>	2.54e-14	6.37e-12	2.08e-11	2.32e-11	1.02e-10	2.23e-10	9.86e-11	1.78e-10
<b>Correlation Coefficient</b>	0.02	0.25	0.52	0.18	0.35	0.52	0.35	0.87

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	1.2822e-05	3.3968e-04	9.4377e-04	1.0087e-03	5.0729e-03	9.7337e-03	8.4771e-03	7.1668e-03
<b>Uncertainty, Step 2</b>	5.99e-08	5.48e-07	9.57e-07	9.17e-07	4.44e-06	8.58e-06	9.31e-06	9.50e-06
<b>Value, Step 4</b>	1.2870e-05	3.4027e-04	9.4441e-04	1.0092e-03	5.0738e-03	9.7358e-03	8.4766e-03	7.1653e-03
<b>Uncertainty, Step 4</b>	5.94e-08	6.65e-07	7.79e-07	1.00e-06	3.15e-06	5.00e-06	6.09e-06	6.29e-06
<b>Covariance</b>	5.46e-17	3.76e-14	3.23e-13	4.45e-13	5.69e-12	1.87e-11	2.27e-11	3.37e-11
<b>Correlation Coefficient</b>	0.02	0.10	0.43	0.48	0.41	0.44	0.40	0.56

## Reported Data for VNIIOFI

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	9.1289e-01	9.1435e-01	9.1699e-01	9.1826e-01	9.1930e-01	9.2011e-01	9.2075e-01	9.2151e-01
<b>Uncertainty, Step 2</b>	5.08e-04	1.30e-03	1.33e-03	1.01e-03	7.69e-04	7.93e-04	7.17e-04	1.15e-03
<b>Value, Step 4</b>	9.1314e-01	9.1475e-01	9.1714e-01	9.1862e-01	9.1964e-01	9.2040e-01	9.2097e-01	9.2183e-01
<b>Uncertainty, Step 4</b>	5.00e-04	1.29e-03	1.33e-03	1.01e-03	7.64e-04	7.90e-04	7.16e-04	1.15e-03
<b>Covariance</b>	2.45e-07	1.58e-06	1.60e-06	9.22e-07	5.53e-07	6.16e-07	5.07e-07	1.30e-06
<b>Correlation Coefficient</b>	0.96	0.94	0.91	0.91	0.94	0.98	0.99	0.99

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	4.0908e-01	6.0741e-01	6.2156e-01	6.0975e-01	6.3716e-01	-	5.0163e-01	-
<b>Uncertainty, Step 2</b>	1.24e-03	6.65e-04	5.17e-04	4.18e-04	4.39e-04	-	4.53e-04	-
<b>Value, Step 4</b>	4.0856e-01	6.0694e-01	6.2115e-01	6.0940e-01	6.3684e-01	5.7624e-01	5.0127e-01	4.5298e-01
<b>Uncertainty, Step 4</b>	1.24e-03	6.65e-04	5.16e-04	4.19e-04	4.39e-04	4.99e-04	4.53e-04	5.50e-04
<b>Covariance</b>	1.25e-06	4.11e-07	2.47e-07	1.60e-07	1.80e-07	-	1.96e-07	-
<b>Correlation Coefficient</b>	0.81	0.93	0.93	0.91	0.93	-	0.95	-

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	2.1148e-02	9.4048e-02	9.0728e-02	7.6050e-02	1.5984e-01	1.4843e-01	1.0148e-01	7.5436e-02
<b>Uncertainty, Step 2</b>	1.14e-03	1.06e-04	5.63e-05	1.09e-04	1.57e-04	1.22e-04	9.72e-05	1.18e-04
<b>Value, Step 4</b>	2.1010e-02	9.4001e-02	9.0781e-02	7.6120e-02	1.5991e-01	1.4848e-01	1.0152e-01	7.5463e-02
<b>Uncertainty, Step 4</b>	1.14e-03	1.05e-04	5.53e-05	1.09e-04	1.57e-04	1.22e-04	9.73e-05	1.18e-04
<b>Covariance</b>	1.25e-06	9.80e-09	2.71e-09	9.62e-09	2.20e-08	1.32e-08	8.51e-09	1.19e-08
<b>Correlation Coefficient</b>	0.96	0.88	0.87	0.81	0.89	0.89	0.90	0.86

## Reported Data for VNIIOFI cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	-	5.2079e-03	8.4320e-03	8.3527e-03	2.6553e-02	3.2193e-02	2.2492e-02	1.6645e-02
<b>Uncertainty, Step 2</b>	-	1.26e-04	9.50e-06	2.34e-05	3.37e-05	2.28e-05	1.32e-05	2.28e-05
<b>Value, Step 4</b>	-	5.1655e-03	8.4360e-03	8.3642e-03	2.6579e-02	3.2192e-02	2.2482e-02	1.6634e-02
<b>Uncertainty, Step 4</b>	-	1.26e-04	9.40e-06	2.31e-05	3.17e-05	2.27e-05	1.32e-05	2.26e-05
<b>Covariance</b>	-	1.57e-08	8.29e-11	4.37e-10	9.03e-10	4.75e-10	1.59e-10	4.29e-10
<b>Correlation Coefficient</b>	-	0.99	0.93	0.81	0.85	0.92	0.91	0.83

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 2</b>	-	-	9.5690e-04	1.0272e-03	5.1476e-03	9.8284e-03	8.5614e-03	7.2348e-03
<b>Uncertainty, Step 2</b>	-	-	8.26e-06	1.06e-05	9.01e-06	1.83e-05	1.91e-05	1.61e-05
<b>Value, Step 4</b>	-	-	9.5670e-04	1.0284e-03	5.1548e-03	9.8266e-03	8.5558e-03	7.2300e-03
<b>Uncertainty, Step 4</b>	-	-	8.24e-06	1.06e-05	8.49e-06	1.83e-05	1.90e-05	1.57e-05
<b>Covariance</b>	-	-	6.64e-11	1.02e-10	5.86e-11	3.02e-10	3.30e-10	2.17e-10
<b>Correlation Coefficient</b>	-	-	0.98	0.91	0.77	0.90	0.91	0.86

## Reported Data for MSL measurements of ASTAR filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1298e-01	9.1462e-01	9.1704e-01	9.1844e-01	9.1948e-01	9.2021e-01	9.2058e-01	9.2089e-01
<b>Uncertainty, Step 1</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Value, Step 3</b>	9.1278e-01	9.1445e-01	9.1688e-01	9.1832e-01	9.1932e-01	9.2009e-01	9.2048e-01	9.2077e-01
<b>Uncertainty, Step 3</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Value, Step 5</b>	9.1275e-01	9.1444e-01	9.1689e-01	9.1834e-01	9.1937e-01	9.2011e-01	9.2051e-01	9.2083e-01
<b>Uncertainty, Step 5</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Covariance</b>	6.49e-09	4.50e-09	8.20e-10	4.69e-10	5.42e-10	7.21e-10	5.86e-10	8.21e-10
<b>Correlation Coefficient</b>	0.29	0.23	0.07	0.06	0.08	0.12	0.10	0.15

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0720e-01	6.0647e-01	6.2030e-01	6.0803e-01	6.3576e-01	5.7520e-01	4.9992e-01	4.5138e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0706e-01	6.0643e-01	6.2018e-01	6.0805e-01	6.3569e-01	5.7513e-01	4.9986e-01	4.5134e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0674e-01	6.0637e-01	6.2004e-01	6.0801e-01	6.3561e-01	5.7491e-01	4.9970e-01	4.5122e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.36e-09	1.61e-10	5.02e-10	2.46e-10	8.91e-10	6.12e-10	2.54e-10
<b>Correlation Coefficient</b>	0.75	0.07	0.01	0.08	0.05	0.07	0.08	0.08

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1432e-02	9.4874e-02	9.1384e-02	7.6568e-02	1.6049e-01	1.4947e-01	1.0238e-01	7.6192e-02
<b>Uncertainty, Step 1</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1419e-02	9.4879e-02	9.1406e-02	7.6593e-02	1.6049e-01	1.4946e-01	1.0238e-01	7.6191e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1374e-02	9.4895e-02	9.1415e-02	7.6597e-02	1.6051e-01	1.4943e-01	1.0235e-01	7.6183e-02
<b>Uncertainty, Step 5</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.23e-09	1.60e-09	2.30e-10	3.19e-10	2.79e-09	4.12e-10	1.88e-10	5.60e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.64	0.80	0.92	0.36	0.24	0.25

## Reported Data for ASTAR cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6490e-04	5.1848e-03	8.4103e-03	8.3155e-03	2.6459e-02	3.2194e-02	2.2520e-02	1.6671e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6429e-04	5.1834e-03	8.4135e-03	8.3182e-03	2.6457e-02	3.2195e-02	2.2522e-02	1.6670e-02
<b>Uncertainty, Step 3</b>	2.70e-06	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.6347e-04	5.1813e-03	8.4146e-03	8.3175e-03	2.6459e-02	3.2188e-02	2.2516e-02	1.6670e-02
<b>Uncertainty, Step 5</b>	2.70e-06	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Covariance</b>	5.77e-12	3.73e-11	2.97e-12	1.38e-11	1.65e-10	1.57e-11	1.29e-11	4.40e-12
<b>Correlation Coefficient</b>	0.79	0.68	0.38	0.71	0.84	0.18	0.29	0.35

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.2530e-05	3.2594e-04	9.0534e-04	9.6815e-04	4.9193e-03	9.4746e-03	8.2613e-03	6.9777e-03
<b>Uncertainty, Step 1</b>	8.00e-07	8.00e-07	3.80e-07	7.30e-07	3.70e-06	2.20e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	1.2258e-05	3.2531e-04	9.0531e-04	9.6843e-04	4.9182e-03	9.4734e-03	8.2603e-03	6.9757e-03
<b>Uncertainty, Step 3</b>	7.90e-07	8.00e-07	3.80e-07	7.30e-07	3.70e-06	2.20e-06	2.30e-06	1.80e-06
<b>Value, Step 5</b>	1.2494e-05	3.2415e-04	9.0498e-04	9.6753e-04	4.9178e-03	9.4710e-03	8.2559e-03	6.9742e-03
<b>Uncertainty, Step 5</b>	8.00e-07	8.00e-07	3.80e-07	7.30e-07	3.70e-06	2.20e-06	2.30e-06	1.90e-06
<b>Covariance</b>	1.82e-14	3.22e-13	7.06e-14	4.12e-13	1.19e-11	1.55e-12	1.23e-12	1.70e-12
<b>Correlation Coefficient</b>	0.03	0.50	0.49	0.77	0.87	0.32	0.22	0.50

## Reported Data for MSL measurements of KRISS filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1272e-01	9.1440e-01	9.1692e-01	9.1837e-01	9.1941e-01	9.2016e-01	9.2054e-01	9.2079e-01
<b>Uncertainty, Step 1</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Value, Step 3</b>	9.1260e-01	9.1431e-01	9.1684e-01	9.1829e-01	9.1934e-01	9.2011e-01	9.2052e-01	9.2074e-01
<b>Uncertainty, Step 3</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Value, Step 5</b>	9.1258e-01	9.1428e-01	9.1682e-01	9.1830e-01	9.1935e-01	9.2010e-01	9.2053e-01	9.2073e-01
<b>Uncertainty, Step 5</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Covariance</b>	6.85e-10	4.63e-10	8.12e-11	5.39e-11	5.51e-11	7.35e-11	5.95e-11	8.15e-11
<b>Correlation Coefficient</b>	0.05	0.03	0.01	0.01	0.01	0.01	0.01	0.02

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0862e-01	6.0800e-01	6.2161e-01	6.0918e-01	6.3676e-01	5.7614e-01	5.0088e-01	4.5232e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.60e-05
<b>Value, Step 3</b>	4.0829e-01	6.0774e-01	6.2134e-01	6.0911e-01	6.3665e-01	5.7602e-01	5.0079e-01	4.5226e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0789e-01	6.0760e-01	6.2118e-01	6.0910e-01	6.3663e-01	5.7586e-01	5.0068e-01	4.5219e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.60e-05
<b>Covariance</b>	2.12e-07	1.85e-09	2.53e-10	5.55e-10	3.15e-10	9.54e-10	6.51e-10	2.99e-10
<b>Correlation Coefficient</b>	0.76	0.09	0.01	0.09	0.06	0.08	0.08	0.10

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1709e-02	9.5687e-02	9.2115e-02	7.7198e-02	1.6147e-01	1.5042e-01	1.0314e-01	7.6827e-02
<b>Uncertainty, Step 1</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1685e-02	9.5644e-02	9.2109e-02	7.7210e-02	1.6146e-01	1.5040e-01	1.0314e-01	7.6822e-02
<b>Uncertainty, Step 3</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1633e-02	9.5620e-02	9.2097e-02	7.7206e-02	1.6147e-01	1.5035e-01	1.0310e-01	7.6804e-02
<b>Uncertainty, Step 5</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.40e-09	1.67e-09	2.31e-10	3.20e-10	2.79e-09	4.12e-10	2.13e-10	5.60e-11
<b>Correlation Coefficient</b>	0.80	0.67	0.64	0.80	0.91	0.36	0.27	0.25



## Reported Data for KRISS cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6268e-04	5.1751e-03	8.3993e-03	8.3062e-03	2.6439e-02	3.2188e-02	2.2521e-02	1.6674e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6323e-04	5.1686e-03	8.3999e-03	8.3078e-03	2.6433e-02	3.2184e-02	2.2521e-02	1.6673e-02
<b>Uncertainty, Step 3</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.6197e-04	5.1676e-03	8.4010e-03	8.3088e-03	2.6440e-02	3.2178e-02	2.2515e-02	1.6673e-02
<b>Uncertainty, Step 5</b>	2.70e-06	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.50e-06	6.70e-06	3.60e-06
<b>Covariance</b>	5.77e-12	3.60e-11	2.85e-12	1.38e-11	1.65e-10	1.53e-11	1.27e-11	4.29e-12
<b>Correlation Coefficient</b>	0.79	0.67	0.36	0.73	0.84	0.17	0.28	0.34

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.0764e-05	3.1635e-04	8.8357e-04	9.4502e-04	4.8289e-03	9.3232e-03	8.1265e-03	6.8602e-03
<b>Uncertainty, Step 1</b>	6.90e-07	7.90e-07	3.70e-07	7.20e-07	3.60e-06	2.20e-06	2.30e-06	1.80e-06
<b>Value, Step 3</b>	1.1902e-05	3.1624e-04	8.8373e-04	9.4552e-04	4.8288e-03	9.3234e-03	8.1272e-03	6.8599e-03
<b>Uncertainty, Step 3</b>	7.60e-07	7.90e-07	3.60e-07	7.20e-07	3.60e-06	2.10e-06	2.30e-06	1.80e-06
<b>Value, Step 5</b>	1.1342e-05	3.1514e-04	8.8393e-04	9.4579e-04	4.8325e-03	9.3254e-03	8.1261e-03	6.8610e-03
<b>Uncertainty, Step 5</b>	7.30e-07	7.90e-07	3.70e-07	7.20e-07	3.60e-06	2.20e-06	2.30e-06	1.90e-06
<b>Covariance</b>	1.56e-14	3.02e-13	6.62e-14	3.88e-13	1.12e-11	1.44e-12	1.11e-12	1.69e-12
<b>Correlation Coefficient</b>	0.03	0.48	0.50	0.75	0.87	0.31	0.21	0.52

## Reported Data for MSL measurements of LNE-CNAM filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1272e-01	9.1441e-01	9.1692e-01	9.1838e-01	9.1941e-01	9.2016e-01	9.2055e-01	9.2083e-01
<b>Uncertainty, Step 1</b>	1.50e-04	1.40e-04	1.10e-04	8.80e-05	8.50e-05	7.90e-05	7.60e-05	7.60e-05
<b>Value, Step 3</b>	9.1256e-01	9.1426e-01	9.1681e-01	9.1827e-01	9.1929e-01	9.2005e-01	9.2046e-01	9.2072e-01
<b>Uncertainty, Step 3</b>	1.50e-04	1.40e-04	1.10e-04	8.80e-05	8.50e-05	7.90e-05	7.60e-05	7.60e-05
<b>Value, Step 5</b>	9.1252e-01	9.1423e-01	9.1679e-01	9.1827e-01	9.1930e-01	9.2007e-01	9.2048e-01	9.2075e-01
<b>Uncertainty, Step 5</b>	1.50e-04	1.40e-04	1.10e-04	8.80e-05	8.50e-05	7.90e-05	7.60e-05	7.60e-05
<b>Covariance</b>	8.01e-09	5.51e-09	9.81e-10	5.49e-10	6.74e-10	8.72e-10	6.76e-10	9.81e-10
<b>Correlation Coefficient</b>	0.36	0.28	0.08	0.07	0.09	0.14	0.12	0.17

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0894e-01	6.0750e-01	6.2147e-01	6.0937e-01	6.3705e-01	5.7676e-01	5.0178e-01	4.5337e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0887e-01	6.0750e-01	6.2141e-01	6.0940e-01	6.3703e-01	5.7669e-01	5.0173e-01	4.5332e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0862e-01	6.0765e-01	6.2145e-01	6.0953e-01	6.3711e-01	5.7666e-01	5.0171e-01	4.5336e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.81e-09	2.34e-10	5.48e-10	2.98e-10	9.55e-10	6.46e-10	2.95e-10
<b>Correlation Coefficient</b>	0.76	0.09	0.01	0.09	0.06	0.08	0.08	0.10

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1606e-02	9.5367e-02	9.1860e-02	7.7001e-02	1.6104e-01	1.4994e-01	1.0275e-01	7.6503e-02
<b>Uncertainty, Step 1</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1593e-02	9.5338e-02	9.1856e-02	7.7013e-02	1.6103e-01	1.4992e-01	1.0274e-01	7.6491e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1530e-02	9.5345e-02	9.1874e-02	7.7019e-02	1.6106e-01	1.4990e-01	1.0272e-01	7.6491e-02
<b>Uncertainty, Step 5</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.32e-09	1.60e-09	2.31e-10	3.19e-10	2.79e-09	4.12e-10	2.14e-10	5.66e-11
<b>Correlation Coefficient</b>	0.81	0.64	0.64	0.80	0.92	0.36	0.27	0.25

## Reported Data for LNE-CNAM cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.9832e-04	5.4838e-03	8.8504e-03	8.7502e-03	2.7484e-02	3.3362e-02	2.3418e-02	1.7387e-02
<b>Uncertainty, Step 1</b>	3.00e-06	7.70e-06	2.90e-06	4.50e-06	1.50e-05	9.50e-06	6.80e-06	3.60e-06
<b>Value, Step 3</b>	3.9828e-04	5.4793e-03	8.8507e-03	8.7514e-03	2.7480e-02	3.3358e-02	2.3416e-02	1.7384e-02
<b>Uncertainty, Step 3</b>	3.00e-06	7.60e-06	2.80e-06	4.50e-06	1.50e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.9536e-04	5.4753e-03	8.8490e-03	8.7471e-03	2.7472e-02	3.3343e-02	2.3405e-02	1.7380e-02
<b>Uncertainty, Step 5</b>	2.90e-06	7.60e-06	2.90e-06	4.50e-06	1.50e-05	9.50e-06	6.80e-06	3.60e-06
<b>Covariance</b>	7.30e-12	4.13e-11	3.09e-12	1.52e-11	1.67e-10	1.66e-11	1.34e-11	4.45e-12
<b>Correlation Coefficient</b>	0.81	0.71	0.38	0.75	0.74	0.19	0.30	0.35

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.1708e-05	3.1017e-04	8.6609e-04	9.2665e-04	4.7569e-03	9.1976e-03	8.0113e-03	6.7584e-03
<b>Uncertainty, Step 1</b>	7.50e-07	7.80e-07	3.60e-07	7.10e-07	3.60e-06	2.10e-06	2.30e-06	1.80e-06
<b>Value, Step 3</b>	1.1673e-05	3.0963e-04	8.6604e-04	9.2678e-04	4.7558e-03	9.1959e-03	8.0097e-03	6.7556e-03
<b>Uncertainty, Step 3</b>	7.50e-07	7.80e-07	3.60e-07	7.10e-07	3.50e-06	2.10e-06	2.20e-06	1.80e-06
<b>Value, Step 5</b>	1.1408e-05	3.0885e-04	8.6605e-04	9.2635e-04	4.7553e-03	9.1934e-03	8.0061e-03	6.7548e-03
<b>Uncertainty, Step 5</b>	7.30e-07	7.80e-07	3.60e-07	7.10e-07	3.60e-06	2.10e-06	2.30e-06	1.80e-06
<b>Covariance</b>	1.69e-14	2.92e-13	6.47e-14	3.72e-13	1.12e-11	1.42e-12	1.10e-12	1.57e-12
<b>Correlation Coefficient</b>	0.03	0.48	0.50	0.74	0.89	0.32	0.22	0.48

## Reported Data for MSL measurements of MKEH filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1262e-01	9.1433e-01	9.1684e-01	9.1832e-01	9.1936e-01	9.2009e-01	9.2051e-01	9.2076e-01
<b>Uncertainty, Step 1</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Value, Step 3</b>	9.1262e-01	9.1432e-01	9.1684e-01	9.1832e-01	9.1932e-01	9.2011e-01	9.2052e-01	9.2063e-01
<b>Uncertainty, Step 3</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Value, Step 5</b>	9.1251e-01	9.1420e-01	9.1672e-01	9.1818e-01	9.1921e-01	9.1994e-01	9.2035e-01	9.2061e-01
<b>Uncertainty, Step 5</b>	1.50e-04	1.40e-04	1.10e-04	8.70e-05	8.40e-05	7.80e-05	7.50e-05	7.50e-05
<b>Covariance</b>	6.49e-09	4.50e-09	8.20e-10	4.69e-10	5.42e-10	7.21e-10	5.86e-10	8.21e-10
<b>Correlation Coefficient</b>	0.29	0.23	0.07	0.06	0.08	0.12	0.10	0.15

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.1001e-01	6.0848e-01	6.2232e-01	6.1022e-01	6.3780e-01	5.7756e-01	5.0267e-01	4.5431e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.1026e-01	6.0877e-01	6.2244e-01	6.1039e-01	6.3788e-01	5.7758e-01	5.0258e-01	4.5433e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0986e-01	6.0892e-01	6.2246e-01	6.1048e-01	6.3792e-01	5.7750e-01	5.0260e-01	4.5429e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.59e-09	1.99e-10	5.25e-10	2.76e-10	9.23e-10	6.32e-10	2.75e-10
<b>Correlation Coefficient</b>	0.75	0.08	0.01	0.09	0.06	0.08	0.08	0.09

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1209e-02	9.4297e-02	9.0811e-02	7.6060e-02	1.5972e-01	1.4871e-01	1.0175e-01	7.5664e-02
<b>Uncertainty, Step 1</b>	9.40e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1226e-02	9.4323e-02	9.0827e-02	7.6079e-02	1.5973e-01	1.4869e-01	1.0174e-01	7.5656e-02
<b>Uncertainty, Step 3</b>	9.40e-05	5.00e-05	1.80e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1140e-02	9.4316e-02	9.0816e-02	7.6062e-02	1.5973e-01	1.4864e-01	1.0169e-01	7.5624e-02
<b>Uncertainty, Step 5</b>	9.40e-05	5.00e-05	1.80e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.06e-09	1.61e-09	2.31e-10	3.19e-10	2.79e-09	3.79e-10	1.89e-10	5.66e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.68	0.80	0.91	0.33	0.24	0.25

## Reported Data for MKEH cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6146e-04	5.1388e-03	8.3430e-03	8.2477e-03	2.6281e-02	3.1974e-02	2.2344e-02	1.6526e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6013e-04	5.1381e-03	8.3466e-03	8.2517e-03	2.6284e-02	3.1977e-02	2.2347e-02	1.6527e-02
<b>Uncertainty, Step 3</b>	2.80e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.5987e-04	5.1361e-03	8.3462e-03	8.2471e-03	2.6283e-02	3.1969e-02	2.2343e-02	1.6528e-02
<b>Uncertainty, Step 5</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.60e-06	3.50e-06
<b>Covariance</b>	5.77e-12	3.60e-11	2.82e-12	1.35e-11	1.65e-10	1.49e-11	1.22e-11	4.38e-12
<b>Correlation Coefficient</b>	0.76	0.67	0.36	0.73	0.84	0.17	0.27	0.35

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.3627e-05	3.4752e-04	9.5660e-04	1.0227e-03	5.1282e-03	9.8232e-03	8.5739e-03	7.2512e-03
<b>Uncertainty, Step 1</b>	8.70e-07	8.30e-07	4.00e-07	7.70e-07	3.80e-06	2.30e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	1.3148e-05	3.4693e-04	9.5676e-04	1.0229e-03	5.1283e-03	9.8238e-03	8.5740e-03	7.2503e-03
<b>Uncertainty, Step 3</b>	1.00e-06	8.40e-07	4.40e-07	8.00e-07	3.90e-06	2.60e-06	2.80e-06	1.90e-06
<b>Value, Step 5</b>	1.3210e-05	3.4646e-04	9.5632e-04	1.0218e-03	5.1262e-03	9.8210e-03	8.5713e-03	7.2491e-03
<b>Uncertainty, Step 5</b>	8.50e-07	8.20e-07	3.90e-07	7.60e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Covariance</b>	2.10e-14	3.64e-13	7.79e-14	4.53e-13	1.27e-11	1.63e-12	1.28e-12	1.84e-12
<b>Correlation Coefficient</b>	0.02	0.52	0.44	0.74	0.85	0.27	0.19	0.51

## Reported Data for MSL measurements of NIST filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1274e-01	9.1445e-01	9.1695e-01	9.1839e-01	9.1941e-01	9.2018e-01	9.2059e-01	9.2087e-01
<b>Uncertainty, Step 1</b>	1.70e-04	1.50e-04	1.10e-04	9.00e-05	8.70e-05	8.20e-05	7.80e-05	8.00e-05
<b>Value, Step 3</b>	9.1263e-01	9.1437e-01	9.1687e-01	9.1834e-01	9.1937e-01	9.2008e-01	9.2052e-01	9.2080e-01
<b>Uncertainty, Step 3</b>	1.70e-04	1.50e-04	1.10e-04	9.00e-05	8.70e-05	8.20e-05	7.80e-05	8.00e-05
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	1.15e-08	7.84e-09	1.41e-09	8.27e-10	9.26e-10	1.28e-09	9.83e-10	1.41e-09
<b>Correlation Coefficient</b>	0.40	0.35	0.12	0.10	0.12	0.19	0.16	0.22

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0894e-01	6.0810e-01	6.2169e-01	6.0925e-01	6.3683e-01	5.7625e-01	5.0101e-01	4.5246e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0846e-01	6.0785e-01	6.2145e-01	6.0919e-01	6.3675e-01	5.7612e-01	5.0093e-01	4.5242e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	2.12e-07	1.27e-09	1.47e-10	4.95e-10	2.38e-10	8.83e-10	6.08e-10	2.49e-10
<b>Correlation Coefficient</b>	0.75	0.06	0.01	0.08	0.05	0.07	0.08	0.08

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1525e-02	9.5103e-02	9.1599e-02	7.6757e-02	1.6074e-01	1.4970e-01	1.0256e-01	7.6341e-02
<b>Uncertainty, Step 1</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1475e-02	9.5042e-02	9.1579e-02	7.6767e-02	1.6072e-01	1.4967e-01	1.0255e-01	7.6331e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	7.23e-09	1.60e-09	2.32e-10	3.19e-10	2.79e-09	4.16e-10	1.90e-10	5.79e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.64	0.80	0.92	0.36	0.24	0.26

## Reported Data for NIST cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6308e-04	5.1645e-03	8.3798e-03	8.2850e-03	2.6391e-02	3.2122e-02	2.2466e-02	1.6628e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.30e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6129e-04	5.1574e-03	8.3803e-03	8.2877e-03	2.6387e-02	3.2119e-02	2.2465e-02	1.6626e-02
<b>Uncertainty, Step 3</b>	2.70e-06	7.30e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	5.77e-12	3.60e-11	2.97e-12	1.38e-11	1.66e-10	1.59e-11	1.25e-11	4.52e-12
<b>Correlation Coefficient</b>	0.79	0.67	0.38	0.71	0.84	0.18	0.28	0.36

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.4293e-05	3.5808e-04	9.8266e-04	1.0499e-03	5.2334e-03	1.0001e-02	8.7343e-03	7.3910e-03
<b>Uncertainty, Step 1</b>	8.00e-07	8.40e-07	3.90e-07	7.80e-07	3.90e-06	2.10e-06	2.20e-06	1.90e-06
<b>Value, Step 3</b>	1.3912e-05	3.5729e-04	9.8273e-04	1.0505e-03	5.2330e-03	9.9998e-03	8.7330e-03	7.3892e-03
<b>Uncertainty, Step 3</b>	8.90e-07	8.40e-07	4.10e-07	7.90e-07	3.90e-06	2.30e-06	2.50e-06	1.90e-06
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	2.40e-14	3.92e-13	8.18e-14	4.78e-13	1.35e-11	1.75e-12	1.41e-12	1.98e-12
<b>Correlation Coefficient</b>	0.03	0.56	0.51	0.78	0.89	0.36	0.26	0.55

## Reported Data for MSL measurements of NMIJ filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1274e-01	9.1443e-01	9.1692e-01	9.1837e-01	9.1941e-01	9.2017e-01	9.2054e-01	9.2085e-01
<b>Uncertainty, Step 1</b>	1.40e-04	1.30e-04	1.10e-04	8.70e-05	8.30e-05	7.70e-05	7.40e-05	7.30e-05
<b>Value, Step 3</b>	9.1264e-01	9.1434e-01	9.1681e-01	9.1824e-01	9.1929e-01	9.2002e-01	9.2041e-01	9.2075e-01
<b>Uncertainty, Step 3</b>	1.40e-04	1.30e-04	1.10e-04	8.70e-05	8.30e-05	7.70e-05	7.40e-05	7.30e-05
<b>Value, Step 5</b>	9.1250e-01	9.1421e-01	9.1669e-01	9.1815e-01	9.1921e-01	9.1996e-01	9.2036e-01	9.2069e-01
<b>Uncertainty, Step 5</b>	1.40e-04	1.30e-04	1.10e-04	8.70e-05	8.30e-05	7.70e-05	7.40e-05	7.30e-05
<b>Covariance</b>	5.13e-09	3.59e-09	6.28e-10	3.61e-10	4.24e-10	5.84e-10	4.64e-10	6.29e-10
<b>Correlation Coefficient</b>	0.26	0.21	0.05	0.05	0.06	0.10	0.08	0.12

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0970e-01	6.0890e-01	6.2241e-01	6.1001e-01	6.3748e-01	5.7690e-01	5.0170e-01	4.5321e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0955e-01	6.0874e-01	6.2220e-01	6.0996e-01	6.3740e-01	5.7682e-01	5.0167e-01	4.5320e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0920e-01	6.0869e-01	6.2205e-01	6.0992e-01	6.3734e-01	5.7666e-01	5.0152e-01	4.5312e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.52e-09	1.90e-10	5.18e-10	2.66e-10	9.15e-10	6.25e-10	2.70e-10
<b>Correlation Coefficient</b>	0.75	0.08	0.01	0.09	0.05	0.08	0.08	0.09

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1768e-02	9.6083e-02	9.2453e-02	7.7430e-02	1.6204e-01	1.5080e-01	1.0333e-01	7.6938e-02
<b>Uncertainty, Step 1</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1766e-02	9.6037e-02	9.2439e-02	7.7427e-02	1.6202e-01	1.5078e-01	1.0332e-01	7.6926e-02
<b>Uncertainty, Step 3</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.70e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1713e-02	9.6014e-02	9.2434e-02	7.7413e-02	1.6204e-01	1.5074e-01	1.0328e-01	7.6912e-02
<b>Uncertainty, Step 5</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.40e-09	1.70e-09	2.35e-10	3.21e-10	2.79e-09	4.19e-10	2.17e-10	5.90e-11
<b>Correlation Coefficient</b>	0.80	0.68	0.65	0.80	0.88	0.36	0.28	0.26



## Reported Data for NMIJ cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0094e-04	5.5166e-03	8.8960e-03	8.7930e-03	2.7585e-02	3.3472e-02	2.3501e-02	1.7454e-02
<b>Uncertainty, Step 1</b>	3.00e-06	7.70e-06	2.90e-06	4.60e-06	1.50e-05	9.50e-06	6.80e-06	3.60e-06
<b>Value, Step 3</b>	4.0152e-04	5.5118e-03	8.8959e-03	8.7942e-03	2.7579e-02	3.3467e-02	2.3500e-02	1.7452e-02
<b>Uncertainty, Step 3</b>	3.10e-06	7.70e-06	2.90e-06	4.50e-06	1.50e-05	9.50e-06	6.80e-06	3.60e-06
<b>Value, Step 5</b>	3.9914e-04	5.5121e-03	8.8979e-03	8.7941e-03	2.7585e-02	3.3467e-02	2.3499e-02	1.7456e-02
<b>Uncertainty, Step 5</b>	3.00e-06	7.70e-06	2.90e-06	4.50e-06	1.50e-05	9.40e-06	6.80e-06	3.60e-06
<b>Covariance</b>	7.30e-12	4.15e-11	3.24e-12	1.56e-11	1.68e-10	1.69e-11	1.38e-11	4.77e-12
<b>Correlation Coefficient</b>	0.79	0.70	0.38	0.75	0.75	0.19	0.30	0.37

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.2021e-05	3.3118e-04	9.1957e-04	9.8314e-04	4.9773e-03	9.5729e-03	8.3506e-03	7.0571e-03
<b>Uncertainty, Step 1</b>	7.70e-07	8.10e-07	3.90e-07	7.40e-07	3.70e-06	2.20e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	1.2643e-05	3.3081e-04	9.1968e-04	9.8365e-04	4.9765e-03	9.5716e-03	8.3498e-03	7.0555e-03
<b>Uncertainty, Step 3</b>	9.90e-07	8.10e-07	4.20e-07	7.70e-07	3.80e-06	2.50e-06	2.70e-06	1.90e-06
<b>Value, Step 5</b>	1.1432e-05	3.3111e-04	9.1991e-04	9.8356e-04	4.9781e-03	9.5738e-03	8.3502e-03	7.0573e-03
<b>Uncertainty, Step 5</b>	7.30e-07	8.10e-07	3.80e-07	7.40e-07	3.70e-06	2.20e-06	2.30e-06	1.80e-06
<b>Covariance</b>	1.82e-14	3.27e-13	7.29e-14	4.23e-13	1.19e-11	1.59e-12	1.25e-12	1.82e-12
<b>Correlation Coefficient</b>	0.02	0.50	0.44	0.74	0.85	0.29	0.19	0.50

## Reported Data for MSL measurements of NMISA filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1261e-01	9.1432e-01	9.1681e-01	9.1826e-01	9.1928e-01	9.2001e-01	9.2044e-01	9.2067e-01
<b>Uncertainty, Step 1</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Value, Step 3</b>	9.1252e-01	9.1422e-01	9.1659e-01	9.1814e-01	9.1917e-01	9.1989e-01	9.2031e-01	9.2052e-01
<b>Uncertainty, Step 3</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Value, Step 5</b>	9.1247e-01	9.1416e-01	9.1669e-01	9.1813e-01	9.1918e-01	9.1995e-01	9.2037e-01	9.2061e-01
<b>Uncertainty, Step 5</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Covariance</b>	1.29e-09	8.74e-10	1.58e-10	8.77e-11	9.81e-11	1.36e-10	1.18e-10	1.58e-10
<b>Correlation Coefficient</b>	0.09	0.06	0.02	0.01	0.01	0.03	0.02	0.03

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.1124e-01	6.0891e-01	6.2271e-01	6.1066e-01	6.3809e-01	5.7796e-01	5.0305e-01	4.5464e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.1090e-01	6.0870e-01	6.2246e-01	6.1056e-01	6.3792e-01	5.7780e-01	5.0288e-01	4.5454e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.1049e-01	6.0851e-01	6.2226e-01	6.1049e-01	6.3782e-01	5.7764e-01	5.0277e-01	4.5446e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.45e-09	1.79e-10	5.14e-10	2.60e-10	9.05e-10	6.16e-10	2.62e-10
<b>Correlation Coefficient</b>	0.75	0.07	0.01	0.08	0.05	0.07	0.08	0.09

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1537e-02	9.5155e-02	9.1661e-02	7.6819e-02	1.6087e-01	1.4982e-01	1.0268e-01	7.6437e-02
<b>Uncertainty, Step 1</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1501e-02	9.5106e-02	9.1641e-02	7.6812e-02	1.6082e-01	1.4978e-01	1.0265e-01	7.6419e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1454e-02	9.5090e-02	9.1637e-02	7.6807e-02	1.6083e-01	1.4975e-01	1.0263e-01	7.6414e-02
<b>Uncertainty, Step 5</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.23e-09	1.60e-09	2.30e-10	3.19e-10	2.79e-09	4.13e-10	2.14e-10	5.64e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.64	0.80	0.92	0.36	0.27	0.25

## Reported Data for NMISA cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6286e-04	5.1653e-03	8.3853e-03	8.2934e-03	2.6408e-02	3.2155e-02	2.2502e-02	1.6659e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.30e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6185e-04	5.1592e-03	8.3842e-03	8.2928e-03	2.6397e-02	3.2149e-02	2.2500e-02	1.6658e-02
<b>Uncertainty, Step 3</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.6114e-04	5.1570e-03	8.3846e-03	8.2919e-03	2.6400e-02	3.2145e-02	2.2496e-02	1.6659e-02
<b>Uncertainty, Step 5</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Covariance</b>	5.77e-12	3.60e-11	2.86e-12	1.38e-11	1.65e-10	1.56e-11	1.28e-11	4.41e-12
<b>Correlation Coefficient</b>	0.79	0.68	0.36	0.73	0.84	0.18	0.28	0.35

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 1</b>	-	-	-	-	-	-	-	-
<b>Value, Step 3</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 3</b>	-	-	-	-	-	-	-	-
<b>Value, Step 5</b>	-	-	-	-	-	-	-	-
<b>Uncertainty, Step 5</b>	-	-	-	-	-	-	-	-
<b>Covariance</b>	-	-	-	-	-	-	-	-
<b>Correlation Coefficient</b>	-	-	-	-	-	-	-	-

## Reported Data for MSL measurements of NPL filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1289e-01	9.1455e-01	9.1700e-01	9.1844e-01	9.1944e-01	9.2018e-01	9.2062e-01	9.2083e-01
<b>Uncertainty, Step 1</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Value, Step 3</b>	9.1283e-01	9.1448e-01	9.1698e-01	9.1840e-01	9.1943e-01	9.2018e-01	9.2059e-01	9.2081e-01
<b>Uncertainty, Step 3</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Value, Step 5</b>	9.1286e-01	9.1453e-01	9.1699e-01	9.1843e-01	9.1944e-01	9.2019e-01	9.2057e-01	9.2080e-01
<b>Uncertainty, Step 5</b>	1.20e-04	1.20e-04	1.00e-04	8.50e-05	8.10e-05	7.30e-05	7.10e-05	6.90e-05
<b>Covariance</b>	1.17e-09	7.71e-10	1.36e-10	8.77e-11	9.81e-11	1.36e-10	9.99e-11	1.37e-10
<b>Correlation Coefficient</b>	0.08	0.05	0.01	0.01	0.01	0.03	0.02	0.03

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0771e-01	6.0727e-01	6.2084e-01	6.0848e-01	6.3606e-01	5.7525e-01	4.9993e-01	4.5135e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0748e-01	6.0714e-01	6.2065e-01	6.0844e-01	6.3600e-01	5.7515e-01	4.9985e-01	4.5129e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.70e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0713e-01	6.0725e-01	6.2067e-01	6.0852e-01	6.3604e-01	5.7512e-01	4.9978e-01	4.5128e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.70e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.15e-09	1.24e-10	4.83e-10	2.21e-10	8.62e-10	5.93e-10	2.32e-10
<b>Correlation Coefficient</b>	0.75	0.06	0.01	0.08	0.05	0.07	0.08	0.08

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1663e-02	9.5747e-02	9.2087e-02	7.7115e-02	1.6142e-01	1.5022e-01	1.0290e-01	7.6589e-02
<b>Uncertainty, Step 1</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1639e-02	9.5687e-02	9.2072e-02	7.7117e-02	1.6141e-01	1.5020e-01	1.0288e-01	7.6573e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1563e-02	9.5660e-02	9.2074e-02	7.7104e-02	1.6141e-01	1.5017e-01	1.0285e-01	7.6562e-02
<b>Uncertainty, Step 5</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.40e-09	1.67e-09	2.30e-10	3.20e-10	2.79e-09	4.13e-10	2.14e-10	5.61e-11
<b>Correlation Coefficient</b>	0.81	0.67	0.64	0.80	0.92	0.36	0.27	0.25

## Reported Data for NPL cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.8526e-04	5.3856e-03	8.7031e-03	8.6049e-03	2.7154e-02	3.2982e-02	2.3126e-02	1.7153e-02
<b>Uncertainty, Step 1</b>	2.90e-06	7.60e-06	2.80e-06	4.50e-06	1.50e-05	9.50e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.8533e-04	5.3815e-03	8.7048e-03	8.6078e-03	2.7153e-02	3.2980e-02	2.3126e-02	1.7152e-02
<b>Uncertainty, Step 3</b>	2.90e-06	7.60e-06	2.80e-06	4.50e-06	1.50e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	3.8613e-04	5.3787e-03	8.7050e-03	8.6048e-03	2.7146e-02	3.2968e-02	2.3117e-02	1.7150e-02
<b>Uncertainty, Step 5</b>	2.90e-06	7.50e-06	2.80e-06	4.50e-06	1.50e-05	9.40e-06	6.70e-06	3.50e-06
<b>Covariance</b>	6.77e-12	3.99e-11	3.06e-12	1.49e-11	1.66e-10	1.56e-11	1.28e-11	4.48e-12
<b>Correlation Coefficient</b>	0.80	0.69	0.39	0.73	0.74	0.17	0.29	0.36

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	-	3.5046e-04	9.6435e-04	1.0309e-03	5.1605e-03	9.8774e-03	8.6229e-03	7.2935e-03
<b>Uncertainty, Step 1</b>	-	8.30e-07	4.00e-07	7.70e-07	3.90e-06	2.30e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	-	3.5068e-04	9.6466e-04	1.0314e-03	5.1612e-03	9.8772e-03	8.6225e-03	7.2922e-03
<b>Uncertainty, Step 3</b>	-	8.30e-07	4.00e-07	7.70e-07	3.90e-06	2.20e-06	2.40e-06	1.90e-06
<b>Value, Step 5</b>	-	3.4992e-04	9.6478e-04	1.0311e-03	5.1607e-03	9.8776e-03	8.6214e-03	7.2926e-03
<b>Uncertainty, Step 5</b>	-	8.30e-07	4.00e-07	7.70e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Covariance</b>	-	3.76e-13	7.57e-14	4.65e-13	1.28e-11	1.58e-12	1.26e-12	1.83e-12
<b>Correlation Coefficient</b>	-	0.55	0.47	0.78	0.84	0.31	0.22	0.51

## Reported Data for MSL measurements of NRC filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1261e-01	9.1436e-01	9.1689e-01	9.1834e-01	9.1940e-01	9.2014e-01	9.2057e-01	9.2081e-01
<b>Uncertainty, Step 1</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Value, Step 3</b>	9.1232e-01	9.1403e-01	9.1655e-01	9.1806e-01	9.1912e-01	9.1991e-01	9.2033e-01	9.2060e-01
<b>Uncertainty, Step 3</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Value, Step 5</b>	9.1207e-01	9.1378e-01	9.1643e-01	9.1799e-01	9.1912e-01	9.1991e-01	9.2036e-01	9.2068e-01
<b>Uncertainty, Step 5</b>	1.20e-04	1.20e-04	1.00e-04	8.40e-05	8.00e-05	7.20e-05	7.00e-05	6.80e-05
<b>Covariance</b>	1.92e-10	1.18e-10	2.28e-11	2.05e-11	1.61e-11	2.13e-11	1.86e-11	2.40e-11
<b>Correlation Coefficient</b>	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.1056e-01	6.0919e-01	6.2285e-01	6.1066e-01	6.3816e-01	5.7782e-01	5.0291e-01	4.5452e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.1049e-01	6.0918e-01	6.2274e-01	6.1069e-01	6.3815e-01	5.7777e-01	5.0289e-01	4.5451e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.1003e-01	6.0914e-01	6.2264e-01	6.1068e-01	6.3813e-01	5.7763e-01	5.0277e-01	4.5445e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.49e-09	1.84e-10	5.17e-10	2.65e-10	9.09e-10	6.20e-10	2.65e-10
<b>Correlation Coefficient</b>	0.75	0.08	0.01	0.08	0.05	0.08	0.08	0.09

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1917e-02	9.6445e-02	9.2855e-02	7.7821e-02	1.6254e-01	1.5127e-01	1.0373e-01	7.7278e-02
<b>Uncertainty, Step 1</b>	9.60e-05	5.10e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1901e-02	9.6396e-02	9.2837e-02	7.7816e-02	1.6252e-01	1.5125e-01	1.0372e-01	7.7263e-02
<b>Uncertainty, Step 3</b>	9.60e-05	5.10e-05	1.90e-05	2.00e-05	5.60e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1815e-02	9.6351e-02	9.2839e-02	7.7808e-02	1.6252e-01	1.5121e-01	1.0368e-01	7.7248e-02
<b>Uncertainty, Step 5</b>	9.60e-05	5.00e-05	1.90e-05	2.00e-05	5.70e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.58e-09	1.70e-09	2.34e-10	3.21e-10	2.90e-09	4.18e-10	2.16e-10	5.83e-11
<b>Correlation Coefficient</b>	0.82	0.65	0.65	0.80	0.92	0.36	0.28	0.26

## Reported Data for NRC cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.6353e-04	5.1612e-03	8.3744e-03	8.2789e-03	2.6373e-02	3.2086e-02	2.2432e-02	1.6597e-02
<b>Uncertainty, Step 1</b>	2.70e-06	7.30e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	3.6181e-04	5.1556e-03	8.3719e-03	8.2779e-03	2.6364e-02	3.2079e-02	2.2430e-02	1.6595e-02
<b>Uncertainty, Step 3</b>	2.70e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.60e-06	3.50e-06
<b>Value, Step 5</b>	3.5966e-04	5.1435e-03	8.3638e-03	8.2692e-03	2.6340e-02	3.2046e-02	2.2408e-02	1.6584e-02
<b>Uncertainty, Step 5</b>	2.80e-06	7.30e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.60e-06	3.50e-06
<b>Covariance</b>	5.77e-12	3.60e-11	2.85e-12	1.35e-11	1.65e-10	1.53e-11	1.21e-11	4.25e-12
<b>Correlation Coefficient</b>	0.79	0.67	0.36	0.71	0.84	0.17	0.27	0.34

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.3542e-05	3.3568e-04	9.3079e-04	9.9507e-04	5.0231e-03	9.6460e-03	8.4143e-03	7.1106e-03
<b>Uncertainty, Step 1</b>	8.70e-07	8.10e-07	3.90e-07	7.50e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	1.2614e-05	3.3574e-04	9.3067e-04	9.9514e-04	5.0213e-03	9.6447e-03	8.4147e-03	7.1096e-03
<b>Uncertainty, Step 3</b>	8.10e-07	8.10e-07	3.80e-07	7.40e-07	3.70e-06	2.20e-06	2.30e-06	1.80e-06
<b>Value, Step 5</b>	1.4192e-05	3.3560e-04	9.3131e-04	9.9530e-04	5.0230e-03	9.6472e-03	8.4149e-03	7.1121e-03
<b>Uncertainty, Step 5</b>	1.10e-06	8.10e-07	4.30e-07	7.80e-07	3.90e-06	2.50e-06	2.80e-06	1.90e-06
<b>Covariance</b>	2.10e-14	3.38e-13	7.31e-14	4.35e-13	1.19e-11	1.53e-12	1.20e-12	1.71e-12
<b>Correlation Coefficient</b>	0.03	0.52	0.49	0.78	0.85	0.32	0.22	0.50

## Reported Data for MSL measurements of PTB filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1289e-01	9.1454e-01	9.1693e-01	9.1837e-01	9.1937e-01	9.2012e-01	9.2048e-01	9.2074e-01
<b>Uncertainty, Step 1</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.80e-05	7.90e-05
<b>Value, Step 3</b>	9.1289e-01	9.1453e-01	9.1692e-01	9.1832e-01	9.1931e-01	9.2006e-01	9.2046e-01	9.2067e-01
<b>Uncertainty, Step 3</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.80e-05	7.90e-05
<b>Value, Step 5</b>	9.1289e-01	9.1452e-01	9.1692e-01	9.1837e-01	9.1940e-01	9.2012e-01	9.2048e-01	9.2076e-01
<b>Uncertainty, Step 5</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.80e-05	7.90e-05
<b>Covariance</b>	9.69e-09	7.22e-09	1.28e-09	7.28e-10	8.72e-10	1.16e-09	9.28e-10	1.28e-09
<b>Correlation Coefficient</b>	0.38	0.32	0.11	0.09	0.12	0.18	0.15	0.21

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0795e-01	6.0722e-01	6.2087e-01	6.0855e-01	6.3615e-01	5.7551e-01	5.0018e-01	4.5161e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 3</b>	4.0776e-01	6.0733e-01	6.2083e-01	6.0859e-01	6.3613e-01	5.7541e-01	5.0015e-01	4.5152e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Value, Step 5</b>	4.0753e-01	6.0747e-01	6.2094e-01	6.0877e-01	6.3626e-01	5.7543e-01	5.0008e-01	4.5155e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.00e-05	1.10e-04	8.80e-05	5.50e-05
<b>Covariance</b>	2.12e-07	1.31e-09	1.51e-10	4.97e-10	2.39e-10	8.82e-10	6.03e-10	2.46e-10
<b>Correlation Coefficient</b>	0.75	0.07	0.01	0.08	0.05	0.07	0.08	0.08

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1395e-02	9.4802e-02	9.1201e-02	7.6360e-02	1.6029e-01	1.4927e-01	1.0219e-01	7.6025e-02
<b>Uncertainty, Step 1</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1365e-02	9.4794e-02	9.1211e-02	7.6372e-02	1.6028e-01	1.4924e-01	1.0219e-01	7.6009e-02
<b>Uncertainty, Step 3</b>	9.50e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1314e-02	9.4806e-02	9.1222e-02	7.6380e-02	1.6031e-01	1.4922e-01	1.0214e-01	7.6004e-02
<b>Uncertainty, Step 5</b>	9.40e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.23e-09	1.61e-09	2.32e-10	3.20e-10	2.79e-09	3.80e-10	1.88e-10	5.62e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.64	0.80	0.92	0.33	0.24	0.25



## Reported Data for PTB cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	3.4347e-04	4.9765e-03	8.1035e-03	8.0118e-03	2.5732e-02	3.1358e-02	2.1874e-02	1.6154e-02
<b>Uncertainty, Step 1</b>	2.60e-06	7.20e-06	2.80e-06	4.30e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 3</b>	3.4324e-04	4.9730e-03	8.1047e-03	8.0127e-03	2.5724e-02	3.1354e-02	2.1873e-02	1.6151e-02
<b>Uncertainty, Step 3</b>	2.60e-06	7.20e-06	2.70e-06	4.20e-06	1.40e-05	9.30e-06	6.60e-06	3.50e-06
<b>Value, Step 5</b>	3.4166e-04	4.9716e-03	8.1072e-03	8.0132e-03	2.5730e-02	3.1350e-02	2.1868e-02	1.6152e-02
<b>Uncertainty, Step 5</b>	2.60e-06	7.20e-06	2.80e-06	4.20e-06	1.40e-05	9.40e-06	6.60e-06	3.50e-06
<b>Covariance</b>	5.30e-12	3.36e-11	2.65e-12	1.25e-11	1.64e-10	1.44e-11	1.18e-11	3.93e-12
<b>Correlation Coefficient</b>	0.78	0.65	0.35	0.69	0.84	0.16	0.27	0.32

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	1.3646e-05	3.4154e-04	9.4329e-04	1.0083e-03	5.0736e-03	9.7313e-03	8.4915e-03	7.1789e-03
<b>Uncertainty, Step 1</b>	8.80e-07	8.20e-07	4.00e-07	7.60e-07	3.80e-06	2.30e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	1.3139e-05	3.4126e-04	9.4330e-04	1.0082e-03	5.0719e-03	9.7304e-03	8.4915e-03	7.1775e-03
<b>Uncertainty, Step 3</b>	8.40e-07	8.20e-07	3.90e-07	7.50e-07	3.80e-06	2.20e-06	2.40e-06	1.80e-06
<b>Value, Step 5</b>	1.4217e-05	3.4084e-04	9.4342e-04	1.0080e-03	5.0738e-03	9.7304e-03	8.4890e-03	7.1779e-03
<b>Uncertainty, Step 5</b>	9.10e-07	8.20e-07	3.90e-07	7.50e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Covariance</b>	2.10e-14	3.53e-13	7.33e-14	4.41e-13	1.27e-11	1.56e-12	1.22e-12	1.71e-12
<b>Correlation Coefficient</b>	0.03	0.53	0.47	0.77	0.88	0.31	0.21	0.50

## Reported Data for MSL measurements of VNIIOFI filters

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A. Correlations are given between measurements on the same filter. Correlations with MSL measurements of other filters would exclude the Non Parallel Filter Surfaces component.

### Filter A

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	9.1295e-01	9.1461e-01	9.1703e-01	9.1847e-01	9.1950e-01	9.2022e-01	9.2064e-01	9.2083e-01
<b>Uncertainty, Step 1</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.70e-05	7.80e-05
<b>Value, Step 3</b>	9.1295e-01	9.1461e-01	9.1700e-01	9.1843e-01	9.1943e-01	9.2016e-01	9.2053e-01	9.2077e-01
<b>Uncertainty, Step 3</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.70e-05	7.80e-05
<b>Value, Step 5</b>	9.1286e-01	9.1454e-01	9.1695e-01	9.1838e-01	9.1938e-01	9.2014e-01	9.2054e-01	9.2069e-01
<b>Uncertainty, Step 5</b>	1.60e-04	1.50e-04	1.10e-04	8.90e-05	8.60e-05	8.10e-05	7.70e-05	7.80e-05
<b>Covariance</b>	9.69e-09	6.92e-09	1.22e-09	7.28e-10	8.20e-10	1.10e-09	8.74e-10	1.22e-09
<b>Correlation Coefficient</b>	0.38	0.31	0.10	0.09	0.11	0.17	0.15	0.20

### Filter B

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	4.0946e-01	6.0735e-01	6.2134e-01	6.0934e-01	6.3690e-01	5.7670e-01	5.0166e-01	4.5318e-01
<b>Uncertainty, Step 1</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.60e-05
<b>Value, Step 3</b>	4.0931e-01	6.0725e-01	6.2122e-01	6.0933e-01	6.3684e-01	5.7662e-01	5.0159e-01	4.5314e-01
<b>Uncertainty, Step 3</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.60e-05
<b>Value, Step 5</b>	4.0908e-01	6.0745e-01	6.2127e-01	6.0942e-01	6.3692e-01	5.7661e-01	5.0159e-01	4.5315e-01
<b>Uncertainty, Step 5</b>	5.30e-04	1.40e-04	1.40e-04	7.80e-05	7.10e-05	1.10e-04	8.80e-05	5.60e-05
<b>Covariance</b>	2.12e-07	2.00e-09	2.76e-10	5.60e-10	3.33e-10	9.74e-10	6.64e-10	3.11e-10
<b>Correlation Coefficient</b>	0.76	0.10	0.01	0.09	0.07	0.08	0.09	0.10

### Filter C

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	2.1136e-02	9.4141e-02	9.0610e-02	7.5842e-02	1.5944e-01	1.4843e-01	1.0150e-01	7.5444e-02
<b>Uncertainty, Step 1</b>	9.40e-05	5.00e-05	1.90e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 3</b>	2.1124e-02	9.4110e-02	9.0595e-02	7.5852e-02	1.5943e-01	1.4840e-01	1.0149e-01	7.5440e-02
<b>Uncertainty, Step 3</b>	9.40e-05	5.00e-05	1.80e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Value, Step 5</b>	2.1065e-02	9.4119e-02	9.0611e-02	7.5835e-02	1.5945e-01	1.4839e-01	1.0148e-01	7.5438e-02
<b>Uncertainty, Step 5</b>	9.30e-05	5.00e-05	1.80e-05	2.00e-05	5.50e-05	3.40e-05	2.80e-05	1.50e-05
<b>Covariance</b>	7.06e-09	1.61e-09	2.32e-10	3.18e-10	2.79e-09	3.81e-10	1.90e-10	5.61e-11
<b>Correlation Coefficient</b>	0.80	0.64	0.68	0.79	0.92	0.33	0.24	0.25

## Reported Data for VNIIOFI cont.

Any data with a grey background were removed by the participant from the comparison analysis after pre-Draft A.

### Filter D

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	-	5.1915e-03	8.4179e-03	8.3199e-03	2.6466e-02	3.2184e-02	2.2506e-02	1.6656e-02
<b>Uncertainty, Step 1</b>	-	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.60e-06
<b>Value, Step 3</b>	-	5.1874e-03	8.4177e-03	8.3213e-03	2.6463e-02	3.2182e-02	2.2506e-02	1.6655e-02
<b>Uncertainty, Step 3</b>	-	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Value, Step 5</b>	-	5.1861e-03	8.4172e-03	8.3185e-03	2.6461e-02	3.2176e-02	2.2501e-02	1.6654e-02
<b>Uncertainty, Step 5</b>	-	7.40e-06	2.80e-06	4.40e-06	1.40e-05	9.40e-06	6.70e-06	3.50e-06
<b>Covariance</b>	-	3.73e-11	2.98e-12	1.38e-11	1.66e-10	1.55e-11	1.29e-11	4.39e-12
<b>Correlation Coefficient</b>	-	0.68	0.38	0.71	0.85	0.18	0.29	0.35

### Filter E

	Wavelength							
	380	400	500	600	700	800	900	1000
<b>Value, Step 1</b>	-	-	9.5553e-04	1.0212e-03	5.1221e-03	9.8147e-03	8.5669e-03	7.2447e-03
<b>Uncertainty, Step 1</b>	-	-	4.00e-07	7.70e-07	3.80e-06	2.30e-06	2.40e-06	1.90e-06
<b>Value, Step 3</b>	-	-	9.5528e-04	1.0211e-03	5.1216e-03	9.8133e-03	8.5651e-03	7.2424e-03
<b>Uncertainty, Step 3</b>	-	-	3.90e-07	7.60e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Value, Step 5</b>	-	-	9.5463e-04	1.0204e-03	5.1203e-03	9.8110e-03	8.5628e-03	7.2414e-03
<b>Uncertainty, Step 5</b>	-	-	3.90e-07	7.60e-07	3.80e-06	2.20e-06	2.40e-06	1.90e-06
<b>Covariance</b>	-	-	7.77e-14	4.53e-13	1.28e-11	1.62e-12	1.27e-12	1.82e-12
<b>Correlation Coefficient</b>	-	-	0.50	0.77	0.89	0.32	0.22	0.51

## Weights Used for DoE Calculation, Filter A

### 380 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.10e-04	3.10e-04	0.131	-
KRISS	2.26e-03	2.26e-03	0.002	-
LNE	4.50e-04	4.50e-04	0.062	-
MKEH	1.00e-03	1.00e-03	0.013	-
NIST	5.22e-04	5.22e-04	0.046	-
NMIJ	5.35e-04	5.35e-04	0.044	-
NMISA	4.02e-03	4.02e-03	0.001	-
NPL	1.82e-04	2.63e-04	0.182	-
NRC	1.51e-04	2.63e-04	0.182	-
PTB	3.44e-04	3.44e-04	0.106	-
VNIOFI	5.04e-04	5.04e-04	0.050	-
MSL	1.42e-04	2.63e-04	0.182	-

### 400 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.25e-04	3.25e-04	0.082	-
KRISS	1.52e-03	1.52e-03	0.004	-
LNE	2.00e-04	2.16e-04	0.187	-
MKEH	9.00e-04	9.00e-04	0.011	-
NIST	5.24e-04	5.24e-04	0.032	-
NMIJ	5.25e-04	5.25e-04	0.032	-
NMISA	4.60e-03	4.60e-03	0.000	-
NPL	1.79e-04	2.16e-04	0.187	-
NRC	1.37e-04	2.16e-04	0.187	-
PTB	3.20e-04	3.20e-04	0.085	-
VNIOFI	1.30e-03	1.30e-03	0.005	-
MSL	1.35e-04	2.16e-04	0.187	-

## Weights Used for DoE Calculation, Filter A

### 500 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.35e-04	3.35e-04	0.070	-
KRISS	1.84e-03	1.84e-03	0.002	-
LNE	2.00e-04	2.07e-04	0.183	-
MKEH	1.00e-03	1.00e-03	0.008	-
NIST	5.27e-04	5.27e-04	0.028	-
NMIJ	3.35e-04	3.35e-04	0.070	-
NMISA	4.26e-03	4.26e-03	0.000	-
NPL	1.70e-04	2.07e-04	0.183	-
NRC	1.28e-04	2.07e-04	0.183	-
PTB	3.03e-04	3.03e-04	0.086	-
VNIIOFI	1.33e-03	1.33e-03	0.004	-
MSL	1.06e-04	2.07e-04	0.183	-

### 600 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.70e-04	3.70e-04	0.051	-
KRISS	1.36e-03	1.36e-03	0.004	-
LNE	1.50e-04	1.91e-04	0.191	-
MKEH	9.00e-04	9.00e-04	0.009	-
NIST	5.29e-04	5.29e-04	0.025	-
NMIJ	3.30e-04	3.30e-04	0.064	-
NMISA	4.14e-03	4.14e-03	0.000	-
NPL	1.59e-04	1.91e-04	0.191	-
NRC	1.14e-04	1.91e-04	0.191	-
PTB	3.06e-04	3.06e-04	0.074	-
VNIIOFI	1.01e-03	1.01e-03	0.007	-
MSL	8.68e-05	1.91e-04	0.191	-

## Weights Used for DoE Calculation, Filter A

### 700 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.87e-04	3.87e-04	0.047	-
KRISS	1.33e-03	1.33e-03	0.004	-
LNE	1.50e-04	1.92e-04	0.192	-
MKEH	9.00e-04	9.00e-04	0.009	-
NIST	5.31e-04	5.31e-04	0.025	-
NMIJ	3.30e-04	3.30e-04	0.065	-
NMISA	4.14e-03	4.14e-03	0.000	-
NPL	1.67e-04	1.92e-04	0.192	-
NRC	1.08e-04	1.92e-04	0.192	-
PTB	3.14e-04	3.14e-04	0.072	-
VNIIOFI	7.66e-04	7.66e-04	0.012	-
MSL	8.34e-05	1.92e-04	0.192	-

### 800 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.20e-04	3.20e-04	0.067	-
KRISS	1.23e-03	1.23e-03	0.005	-
LNE	1.50e-04	1.90e-04	0.191	-
MKEH	1.00e-03	1.00e-03	0.007	-
NIST	5.32e-04	5.32e-04	0.024	-
NMIJ	3.45e-04	3.45e-04	0.058	-
NMISA	5.07e-03	5.07e-03	0.000	-
NPL	1.53e-04	1.90e-04	0.191	-
NRC	1.15e-04	1.90e-04	0.191	-
PTB	3.27e-04	3.27e-04	0.065	-
VNIIOFI	7.92e-04	7.92e-04	0.011	-
MSL	7.69e-05	1.90e-04	0.191	-

## Weights Used for DoE Calculation, Filter A

### 900 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	3.35e-04	3.35e-04	0.065	-
KRISS	1.34e-03	1.34e-03	0.004	-
LNE	2.00e-04	2.00e-04	0.183	-
MKEH	1.20e-03	1.20e-03	0.005	-
NIST	5.33e-04	5.33e-04	0.026	-
NMIJ	3.30e-04	3.30e-04	0.067	-
NMISA	1.81e-02	1.81e-02	0.000	-
NPL	1.51e-04	1.98e-04	0.188	-
NRC	1.11e-04	1.98e-04	0.188	-
PTB	3.19e-04	3.19e-04	0.072	-
VNIIOFI	7.16e-04	7.16e-04	0.014	-
MSL	7.41e-05	1.98e-04	0.188	-

### 1000 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	4.20e-04	4.20e-04	0.044	-
KRISS	1.63e-03	1.63e-03	0.003	-
LNE	2.00e-04	2.01e-04	0.192	-
MKEH	1.40e-03	1.40e-03	0.004	-
NIST	5.33e-04	5.33e-04	0.027	-
NMIJ	3.25e-04	3.25e-04	0.073	-
NMISA	2.21e-02	2.21e-02	0.000	-
NPL	1.53e-04	2.01e-04	0.192	-
NRC	1.37e-04	2.01e-04	0.192	-
PTB	3.17e-04	3.17e-04	0.077	-
VNIIOFI	1.15e-03	1.15e-03	0.006	-
MSL	7.36e-05	2.01e-04	0.192	-

## Weights Used for DoE Calculation, Filter B

### 380 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.30e-03	1.30e-03	0.038	-
KRISS	2.39e-03	2.39e-03	0.011	-
LNE	5.50e-04	6.02e-04	0.179	-
MKEH	1.49e-03	1.49e-03	0.029	-
NIST	1.67e-03	1.67e-03	0.023	-
NMIJ	9.50e-04	9.50e-04	0.072	-
NMISA	4.12e-03	4.12e-03	0.004	-
NPL	9.90e-04	9.90e-04	0.066	-
NRC	2.07e-04	6.02e-04	0.179	-
PTB	3.87e-04	6.02e-04	0.179	-
VNIIOFI	1.24e-03	1.24e-03	0.042	-
MSL	5.30e-04	6.02e-04	0.179	-

### 400 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.62e-04	2.62e-04	0.091	-
KRISS	1.46e-03	1.46e-03	0.003	-
LNE	2.00e-04	2.00e-04	0.156	-
MKEH	6.30e-04	6.30e-04	0.016	-
NIST	9.65e-04	9.65e-04	0.007	-
NMIJ	3.70e-04	3.70e-04	0.046	-
NMISA	4.50e-03	4.50e-03	0.000	-
NPL	2.11e-04	2.11e-04	0.141	-
NRC	1.01e-04	1.85e-04	0.182	-
PTB	1.96e-04	1.96e-04	0.162	-
VNIIOFI	6.65e-04	6.65e-04	0.014	-
MSL	1.40e-04	1.85e-04	0.182	-



## Weights Used for DoE Calculation, Filter B

### 500 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.40e-04	2.40e-04	0.083	-
KRISS	1.34e-03	1.34e-03	0.003	-
LNE	2.00e-04	2.00e-04	0.119	-
MKEH	4.40e-04	4.40e-04	0.025	-
NIST	3.09e-04	3.09e-04	0.050	-
NMIJ	2.85e-04	2.85e-04	0.059	-
NMISA	4.24e-03	4.24e-03	0.000	-
NPL	1.76e-04	1.76e-04	0.154	-
NRC	8.20e-05	1.69e-04	0.167	-
PTB	1.75e-04	1.75e-04	0.156	-
VNIIOFI	5.17e-04	5.17e-04	0.018	-
MSL	1.40e-04	1.69e-04	0.167	-

### 600 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.27e-04	2.27e-04	0.067	-
KRISS	1.12e-03	1.12e-03	0.003	-
LNE	2.00e-04	2.00e-04	0.086	-
MKEH	4.40e-04	4.40e-04	0.018	-
NIST	1.87e-04	1.87e-04	0.099	-
NMIJ	2.80e-04	2.80e-04	0.044	-
NMISA	4.16e-03	4.16e-03	0.000	-
NPL	1.33e-04	1.39e-04	0.178	-
NRC	7.51e-05	1.39e-04	0.178	-
PTB	1.64e-04	1.64e-04	0.129	-
VNIIOFI	4.19e-04	4.19e-04	0.020	-
MSL	7.79e-05	1.39e-04	0.178	-

## Weights Used for DoE Calculation, Filter B

### 700 nm

Mandel-Paule added uncertainty = 2.9e-05  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.60e-04	2.60e-04	0.052	0.053
KRISS	1.36e-03	1.36e-03	0.002	0.002
LNE	2.00e-04	2.00e-04	0.088	0.089
MKEH	4.10e-04	4.10e-04	0.021	0.022
NIST	1.82e-04	1.82e-04	0.105	0.107
NMIJ	2.90e-04	2.90e-04	0.042	0.043
NMISA	4.09e-03	4.09e-03	0.000	0.000
NPL	1.36e-04	1.39e-04	0.181	0.179
NRC	8.25e-05	1.39e-04	0.181	0.179
PTB	1.64e-04	1.64e-04	0.130	0.130
VNIIOFI	4.39e-04	4.39e-04	0.018	0.019
MSL	7.03e-05	1.39e-04	0.181	0.179

### 800 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.40e-04	2.40e-04	0.074	-
KRISS	1.93e-03	1.93e-03	0.001	-
LNE	2.00e-04	2.00e-04	0.107	-
MKEH	4.65e-04	4.65e-04	0.020	-
NIST	1.81e-04	1.81e-04	0.130	-
NMIJ	2.90e-04	2.90e-04	0.051	-
NMISA	5.05e-03	5.05e-03	0.000	-
NPL	1.69e-04	1.69e-04	0.150	-
NRC	8.53e-05	1.58e-04	0.172	-
PTB	2.00e-04	2.00e-04	0.106	-
VNIIOFI	4.99e-04	4.99e-04	0.017	-
MSL	1.10e-04	1.58e-04	0.172	-

## Weights Used for DoE Calculation, Filter B

### 900 nm

Mandel-Paule added uncertainty = 1.7e-05  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.86e-04	2.86e-04	0.036	0.036
KRISS	9.19e-04	9.19e-04	0.003	0.004
LNE	2.00e-04	2.00e-04	0.073	0.074
MKEH	5.70e-04	5.70e-04	0.009	0.009
NIST	1.42e-04	1.42e-04	0.145	0.145
NMIJ	2.45e-04	2.45e-04	0.049	0.049
NMISA	1.65e-02	1.65e-02	0.000	0.000
NPL	1.37e-04	1.37e-04	0.157	0.157
NRC	8.71e-05	1.31e-04	0.171	0.171
PTB	1.31e-04	1.31e-04	0.171	0.170
VNIIOFI	4.53e-04	4.53e-04	0.014	0.014
MSL	8.80e-05	1.31e-04	0.171	0.171

### 1000 nm

Mandel-Paule added uncertainty = 1.7e-05  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.94e-04	1.94e-04	0.049	0.050
KRISS	1.60e-03	1.60e-03	0.001	0.001
LNE	1.00e-04	1.04e-04	0.170	0.170
MKEH	4.20e-04	4.20e-04	0.010	0.011
NIST	1.01e-04	1.04e-04	0.170	0.170
NMIJ	2.10e-04	2.10e-04	0.042	0.043
NMISA	2.16e-02	2.16e-02	0.000	0.000
NPL	1.01e-04	1.04e-04	0.170	0.170
NRC	7.51e-05	1.04e-04	0.170	0.170
PTB	2.15e-04	2.15e-04	0.040	0.041
VNIIOFI	5.50e-04	5.50e-04	0.006	0.006
MSL	5.52e-05	1.04e-04	0.170	0.170

## Weights Used for DoE Calculation, Filter C

### 380 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.61e-04	2.61e-04	0.058	-
KRISS	4.54e-04	4.54e-04	0.019	-
LNE	1.10e-04	1.43e-04	0.195	-
MKEH	7.45e-04	7.45e-04	0.007	-
NIST	6.13e-04	6.13e-04	0.011	-
NMIJ	2.50e-04	2.50e-04	0.063	-
NMISA	6.26e-03	6.26e-03	0.000	-
NPL	2.59e-04	2.59e-04	0.059	-
NRC	9.51e-05	1.43e-04	0.195	-
PTB	4.65e-05	1.43e-04	0.195	-
VNIIOFI	1.14e-03	1.14e-03	0.003	-
MSL	9.50e-05	1.43e-04	0.195	-

### 400 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.26e-04	1.26e-04	0.068	-
KRISS	5.22e-04	5.22e-04	0.004	-
LNE	8.50e-05	8.50e-05	0.149	-
MKEH	2.12e-04	2.12e-04	0.024	-
NIST	3.51e-04	3.51e-04	0.009	-
NMIJ	1.20e-04	1.20e-04	0.075	-
NMISA	4.69e-03	4.69e-03	0.000	-
NPL	1.11e-04	1.11e-04	0.088	-
NRC	8.39e-05	8.39e-05	0.153	-
PTB	4.52e-05	8.01e-05	0.168	-
VNIIOFI	1.06e-04	1.06e-04	0.096	-
MSL	5.01e-05	8.01e-05	0.168	-

## Weights Used for DoE Calculation, Filter C

### 500 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	6.30e-05	6.30e-05	0.095	-
KRISS	2.08e-04	2.08e-04	0.009	-
LNE	8.00e-05	8.00e-05	0.059	-
MKEH	2.13e-04	2.13e-04	0.008	-
NIST	1.27e-04	1.27e-04	0.023	-
NMIJ	1.15e-04	1.15e-04	0.029	-
NMISA	4.31e-03	4.31e-03	0.000	-
NPL	4.72e-05	4.72e-05	0.169	-
NRC	6.08e-05	6.08e-05	0.102	-
PTB	1.99e-05	4.43e-05	0.192	-
VNIIOFI	5.58e-05	5.58e-05	0.121	-
MSL	1.89e-05	4.43e-05	0.192	-

### 600 nm

Mandel-Paule added uncertainty = 1.7e-06  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	6.75e-05	6.75e-05	0.062	0.062
KRISS	1.91e-04	1.91e-04	0.008	0.008
LNE	7.00e-05	7.00e-05	0.057	0.058
MKEH	2.29e-04	2.29e-04	0.005	0.005
NIST	8.49e-05	8.49e-05	0.039	0.039
NMIJ	8.95e-05	8.95e-05	0.035	0.035
NMISA	4.71e-03	4.71e-03	0.000	0.000
NPL	3.02e-05	3.83e-05	0.192	0.192
NRC	2.26e-05	3.83e-05	0.192	0.192
PTB	1.93e-05	3.83e-05	0.192	0.192
VNIIOFI	1.09e-04	1.09e-04	0.024	0.024
MSL	2.00e-05	3.83e-05	0.192	0.192

## Weights Used for DoE Calculation, Filter C

### 700 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.66e-04	1.66e-04	0.055	-
KRISS	4.72e-04	4.72e-04	0.007	-
LNE	1.40e-04	1.40e-04	0.077	-
MKEH	5.01e-04	5.01e-04	0.006	-
NIST	7.07e-05	9.20e-05	0.178	-
NMIJ	2.70e-04	2.70e-04	0.021	-
NMISA	4.18e-03	4.18e-03	0.000	-
NPL	1.53e-04	1.53e-04	0.064	-
NRC	8.72e-05	9.20e-05	0.178	-
PTB	4.53e-05	9.20e-05	0.178	-
VNIIOFI	1.57e-04	1.57e-04	0.061	-
MSL	5.53e-05	9.20e-05	0.178	-

### 800 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	9.05e-05	9.05e-05	0.073	-
KRISS	4.29e-04	4.29e-04	0.003	-
LNE	1.20e-04	1.20e-04	0.042	-
MKEH	4.37e-04	4.37e-04	0.003	-
NIST	6.42e-05	6.42e-05	0.146	-
NMIJ	1.80e-04	1.80e-04	0.019	-
NMISA	5.07e-03	5.07e-03	0.000	-
NPL	6.97e-05	6.97e-05	0.124	-
NRC	4.58e-05	5.73e-05	0.183	-
PTB	3.99e-05	5.73e-05	0.183	-
VNIIOFI	1.22e-04	1.22e-04	0.041	-
MSL	3.40e-05	5.73e-05	0.183	-

## Weights Used for DoE Calculation, Filter C

### 900 nm

Mandel-Paule added uncertainty = 5.6e-06  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	7.50e-05	7.50e-05	0.066	0.066
KRISS	2.48e-04	2.48e-04	0.006	0.006
LNE	9.00e-05	9.00e-05	0.045	0.046
MKEH	2.09e-04	2.09e-04	0.008	0.009
NIST	5.94e-05	5.94e-05	0.104	0.105
NMIJ	1.14e-04	1.14e-04	0.028	0.028
NMISA	3.99e-02	3.99e-02	0.000	0.000
NPL	5.06e-05	5.06e-05	0.144	0.144
NRC	3.09e-05	4.45e-05	0.186	0.185
PTB	2.29e-05	4.45e-05	0.186	0.185
VNIIOFI	9.73e-05	9.73e-05	0.039	0.039
MSL	2.80e-05	4.45e-05	0.186	0.185

### 1000 nm

Mandel-Paule added uncertainty = 2.9e-06  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	6.20e-05	6.20e-05	0.049	0.049
KRISS	2.04e-04	2.04e-04	0.005	0.005
LNE	7.00e-05	7.00e-05	0.039	0.039
MKEH	2.30e-04	2.30e-04	0.004	0.004
NIST	1.94e-05	3.13e-05	0.193	0.192
NMIJ	7.30e-05	7.30e-05	0.035	0.036
NMISA	4.13e-02	4.13e-02	0.000	0.000
NPL	2.63e-05	3.13e-05	0.193	0.192
NRC	1.79e-05	3.13e-05	0.193	0.192
PTB	4.73e-05	4.73e-05	0.084	0.085
VNIIOFI	1.18e-04	1.18e-04	0.014	0.014
MSL	1.50e-05	3.13e-05	0.193	0.192

## Weights Used for DoE Calculation, Filter D

### 380 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	9.95e-06	9.95e-06	0.060	-
KRISS	2.24e-05	2.24e-05	0.012	-
LNE	6.00e-06	6.00e-06	0.165	-
MKEH	9.50e-06	9.50e-06	0.066	-
NIST	4.62e-05	4.62e-05	0.003	-
NMIJ	1.75e-05	1.75e-05	0.019	-
NMISA	3.66e-02	3.66e-02	0.000	-
NPL	1.75e-05	1.75e-05	0.019	-
NRC	1.83e-06	5.21e-06	0.219	-
PTB	1.22e-06	5.21e-06	0.219	-
VNIOFI	-	-	-	-
MSL	2.78e-06	5.21e-06	0.219	-

### 400 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.57e-05	1.57e-05	0.089	-
KRISS	4.99e-05	4.99e-05	0.009	-
LNE	8.00e-06	1.06e-05	0.193	-
MKEH	2.60e-05	2.60e-05	0.033	-
NIST	3.24e-05	3.24e-05	0.021	-
NMIJ	4.25e-05	4.25e-05	0.012	-
NMISA	1.11e-02	1.11e-02	0.000	-
NPL	1.88e-05	1.88e-05	0.062	-
NRC	8.77e-06	1.06e-05	0.193	-
PTB	5.20e-06	1.06e-05	0.193	-
VNIOFI	1.26e-04	1.26e-04	0.001	-
MSL	7.41e-06	1.06e-05	0.193	-



## Weights Used for DoE Calculation, Filter D

### 500 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.01e-05	1.01e-05	0.076	-
KRISS	2.19e-05	2.19e-05	0.016	-
LNE	1.20e-05	1.20e-05	0.054	-
MKEH	1.61e-05	1.61e-05	0.030	-
NIST	1.51e-05	1.51e-05	0.034	-
NMIJ	3.50e-05	3.50e-05	0.006	-
NMISA	6.09e-03	6.09e-03	0.000	-
NPL	4.82e-06	6.65e-06	0.174	-
NRC	6.28e-06	6.65e-06	0.174	-
PTB	6.51e-06	6.65e-06	0.174	-
VNIOFI	9.45e-06	9.45e-06	0.086	-
MSL	2.81e-06	6.65e-06	0.174	-

### 600 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.33e-05	1.33e-05	0.083	-
KRISS	3.27e-05	3.27e-05	0.014	-
LNE	1.20e-05	1.20e-05	0.102	-
MKEH	2.17e-05	2.17e-05	0.031	-
NIST	1.95e-05	1.95e-05	0.039	-
NMIJ	2.85e-05	2.85e-05	0.018	-
NMISA	7.51e-03	7.51e-03	0.000	-
NPL	6.32e-06	8.78e-06	0.191	-
NRC	5.08e-06	8.78e-06	0.191	-
PTB	1.15e-05	1.15e-05	0.111	-
VNIOFI	2.33e-05	2.33e-05	0.027	-
MSL	4.39e-06	8.78e-06	0.191	-

## Weights Used for DoE Calculation, Filter D

### 700 nm

Mandel-Paule added uncertainty = 1.1e-06  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	5.22e-05	5.22e-05	0.034	0.034
KRISS	1.12e-04	1.12e-04	0.007	0.007
LNE	2.85e-05	2.85e-05	0.114	0.114
MKEH	6.06e-05	6.06e-05	0.025	0.025
NIST	2.59e-05	2.59e-05	0.137	0.137
NMIJ	9.85e-05	9.85e-05	0.010	0.010
NMISA	4.94e-03	4.94e-03	0.000	0.000
NPL	3.67e-05	3.67e-05	0.068	0.068
NRC	1.92e-05	2.31e-05	0.173	0.173
PTB	1.81e-05	2.31e-05	0.173	0.173
VNIIOFI	3.27e-05	3.27e-05	0.086	0.086
MSL	1.43e-05	2.31e-05	0.173	0.173

### 800 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.98e-05	2.98e-05	0.051	-
KRISS	5.83e-05	5.83e-05	0.013	-
LNE	3.50e-05	3.50e-05	0.037	-
MKEH	8.63e-05	8.63e-05	0.006	-
NIST	1.62e-05	1.62e-05	0.173	-
NMIJ	9.85e-05	9.85e-05	0.005	-
NMISA	6.15e-03	6.15e-03	0.000	-
NPL	1.61e-05	1.61e-05	0.176	-
NRC	1.04e-05	1.61e-05	0.176	-
PTB	2.16e-05	2.16e-05	0.098	-
VNIIOFI	2.28e-05	2.28e-05	0.088	-
MSL	9.42e-06	1.61e-05	0.176	-

## Weights Used for DoE Calculation, Filter D

### 900 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	2.35e-05	2.35e-05	0.055	-
KRISS	6.40e-05	6.40e-05	0.007	-
LNE	2.95e-05	2.95e-05	0.035	-
MKEH	5.69e-05	5.69e-05	0.009	-
NIST	2.08e-05	2.08e-05	0.071	-
NMIJ	8.85e-05	8.85e-05	0.004	-
NMISA	2.07e-01	2.07e-01	0.000	-
NPL	1.29e-05	1.31e-05	0.179	-
NRC	7.88e-06	1.31e-05	0.179	-
PTB	1.69e-05	1.69e-05	0.107	-
VNIIOFI	1.32e-05	1.32e-05	0.176	-
MSL	6.70e-06	1.31e-05	0.179	-

### 1000 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.80e-05	1.80e-05	0.067	-
KRISS	4.05e-05	4.05e-05	0.013	-
LNE	2.25e-05	2.25e-05	0.043	-
MKEH	4.33e-05	4.33e-05	0.012	-
NIST	1.48e-05	1.48e-05	0.099	-
NMIJ	4.60e-05	4.60e-05	0.010	-
NMISA	9.79e-02	9.79e-02	0.000	-
NPL	6.86e-06	1.04e-05	0.202	-
NRC	4.77e-06	1.04e-05	0.202	-
PTB	1.43e-05	1.43e-05	0.107	-
VNIIOFI	2.27e-05	2.27e-05	0.042	-
MSL	3.55e-06	1.04e-05	0.202	-

## Weights Used for DoE Calculation, Filter E

### 380 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	4.25e-07	4.25e-07	0.208	-
KRISS	1.58e-06	1.58e-06	0.015	-
LNE	4.50e-07	4.50e-07	0.186	-
MKEH	4.90e-06	4.90e-06	0.002	-
NIST	2.69e-05	2.69e-05	0.000	-
NMIJ	5.05e-06	5.05e-06	0.001	-
NMISA	-	-	-	-
NPL	-	-	-	-
NRC	1.11e-07	3.75e-07	0.267	-
PTB	5.97e-08	3.75e-07	0.267	-
VNIOFI	-	-	-	-
MSL	8.31e-07	8.31e-07	0.054	-

### 400 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.43e-06	1.43e-06	0.102	-
KRISS	8.96e-06	8.96e-06	0.003	-
LNE	1.15e-06	1.15e-06	0.158	-
MKEH	1.07e-05	1.07e-05	0.002	-
NIST	2.11e-05	2.11e-05	0.000	-
NMIJ	6.80e-06	6.80e-06	0.005	-
NMISA	-	-	-	-
NPL	6.35e-06	6.35e-06	0.005	-
NRC	6.51e-07	9.30e-07	0.242	-
PTB	6.07e-07	9.30e-07	0.242	-
VNIOFI	-	-	-	-
MSL	8.11e-07	9.30e-07	0.242	-

## Weights Used for DoE Calculation, Filter E

### 500 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.63e-06	1.63e-06	0.128	-
KRISS	4.44e-06	4.44e-06	0.017	-
LNE	2.35e-06	2.35e-06	0.061	-
MKEH	7.10e-06	7.10e-06	0.007	-
NIST	1.33e-05	1.33e-05	0.002	-
NMIJ	7.35e-06	7.35e-06	0.006	-
NMISA	-	-	-	-
NPL	1.67e-06	1.67e-06	0.122	-
NRC	6.01e-07	1.25e-06	0.217	-
PTB	8.68e-07	1.25e-06	0.217	-
VNIIOFI	8.25e-06	8.25e-06	0.005	-
MSL	3.90e-07	1.25e-06	0.217	-

### 600 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.87e-06	1.87e-06	0.095	-
KRISS	4.51e-06	4.51e-06	0.016	-
LNE	2.30e-06	2.30e-06	0.063	-
MKEH	5.50e-06	5.50e-06	0.011	-
NIST	1.35e-05	1.35e-05	0.002	-
NMIJ	7.95e-06	7.95e-06	0.005	-
NMISA	-	-	-	-
NPL	1.27e-06	1.29e-06	0.201	-
NRC	5.63e-07	1.29e-06	0.201	-
PTB	9.59e-07	1.29e-06	0.201	-
VNIIOFI	1.06e-05	1.06e-05	0.003	-
MSL	7.50e-07	1.29e-06	0.201	-

## Weights Used for DoE Calculation, Filter E

### 700 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.40e-05	1.40e-05	0.038	-
KRISS	1.84e-05	1.84e-05	0.022	-
LNE	6.75e-06	6.75e-06	0.163	-
MKEH	2.09e-05	2.09e-05	0.017	-
NIST	1.54e-05	1.54e-05	0.031	-
NMIJ	4.40e-05	4.40e-05	0.004	-
NMISA	-	-	-	-
NPL	9.90e-06	9.90e-06	0.076	-
NRC	5.20e-06	6.36e-06	0.184	-
PTB	3.80e-06	6.36e-06	0.184	-
VNIIOFI	8.75e-06	8.75e-06	0.097	-
MSL	3.76e-06	6.36e-06	0.184	-

### 800 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	1.02e-05	1.02e-05	0.094	-
KRISS	1.79e-05	1.79e-05	0.031	-
LNE	1.40e-05	1.40e-05	0.050	-
MKEH	4.34e-05	4.34e-05	0.005	-
NIST	1.39e-05	1.39e-05	0.050	-
NMIJ	5.75e-05	5.75e-05	0.003	-
NMISA	-	-	-	-
NPL	5.57e-06	7.28e-06	0.184	-
NRC	5.01e-06	7.28e-06	0.184	-
PTB	6.79e-06	7.28e-06	0.184	-
VNIIOFI	1.83e-05	1.83e-05	0.029	-
MSL	2.23e-06	7.28e-06	0.184	-

## Weights Used for DoE Calculation, Filter E

### 900 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	9.80e-06	9.80e-06	0.100	-
KRISS	2.55e-05	2.55e-05	0.015	-
LNE	1.30e-05	1.30e-05	0.057	-
MKEH	2.08e-05	2.08e-05	0.022	-
NIST	1.41e-05	1.41e-05	0.048	-
NMIJ	5.60e-05	5.60e-05	0.003	-
NMISA	-	-	-	-
NPL	4.46e-06	7.15e-06	0.188	-
NRC	5.57e-06	7.15e-06	0.188	-
PTB	7.70e-06	7.70e-06	0.163	-
VNIOFI	1.91e-05	1.91e-05	0.026	-
MSL	2.40e-06	7.15e-06	0.188	-

### 1000 nm

Mandel-Paule added uncertainty = 0.0e+00  
Uncertainties in grey were subject to cut-off

Laboratory	Mean Reported Uncertainty	Uncertainty After Cut-off	Weight	Weight After Mandel-Paule
ASTAR	9.27e-06	9.27e-06	0.090	-
KRISS	2.32e-05	2.32e-05	0.014	-
LNE	1.10e-05	1.10e-05	0.064	-
MKEH	2.36e-05	2.36e-05	0.014	-
NIST	1.38e-05	1.38e-05	0.041	-
NMIJ	6.50e-05	6.50e-05	0.002	-
NMISA	-	-	-	-
NPL	3.61e-06	6.13e-06	0.207	-
NRC	3.13e-06	6.13e-06	0.207	-
PTB	7.89e-06	7.89e-06	0.124	-
VNIOFI	1.59e-05	1.59e-05	0.031	-
MSL	1.87e-06	6.13e-06	0.207	-

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter A, 380 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-8.6E-09	-1.1E-08	-1.6E-08	-1.5E-08	-1.1E-08	-1.5E-08	-9.4E-09	-9.0E-09	-1.5E-08	-1.7E-08	-3.6E-09
KRISS		-5.5E-09	-1.1E-08	-9.6E-09	-6.0E-09	-9.7E-09	-4.1E-09	-3.7E-09	-1.0E-08	-1.1E-08	1.8E-09
LNE			-1.3E-08	-1.2E-08	-8.2E-09	-1.2E-08	-6.3E-09	-5.9E-09	-1.2E-08	-1.3E-08	-4.3E-10
MKEH				-1.7E-08	-1.4E-08	-1.7E-08	-1.2E-08	-1.1E-08	-1.8E-08	-1.9E-08	-5.9E-09
NIST					-1.2E-08	-1.6E-08	-1.0E-08	-1.0E-08	-1.6E-08	-1.8E-08	-4.6E-09
NMIJ						-1.2E-08	-6.8E-09	-6.4E-09	-1.3E-08	-1.4E-08	-9.3E-10
NMISA							-1.0E-08	-1.0E-08	-1.6E-08	-1.8E-08	-4.7E-09
NPL								-4.5E-09	-1.1E-08	-1.2E-08	9.8E-10
NRC									-1.0E-08	-1.2E-08	1.3E-09
PTB										-1.8E-08	-5.0E-09
VNIIOFI											-6.2E-09

Filter A, 400 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-8.9E-09	-7.8E-09	-1.1E-08	-9.4E-09	-7.0E-09	-9.9E-09	-7.5E-09	-6.6E-09	-1.0E-08	-1.0E-08	-1.7E-09
KRISS		-8.3E-09	-1.1E-08	-1.0E-08	-7.6E-09	-1.0E-08	-8.0E-09	-7.1E-09	-1.1E-08	-1.1E-08	-2.2E-09
LNE			-9.9E-09	-8.8E-09	-6.4E-09	-9.3E-09	-6.8E-09	-6.0E-09	-9.8E-09	-9.6E-09	-1.1E-09
MKEH				-1.2E-08	-9.2E-09	-1.2E-08	-9.6E-09	-8.7E-09	-1.3E-08	-1.2E-08	-3.8E-09
NIST					-8.1E-09	-1.1E-08	-8.5E-09	-7.6E-09	-1.1E-08	-1.1E-08	-2.7E-09
NMIJ						-8.5E-09	-6.1E-09	-5.2E-09	-9.1E-09	-8.9E-09	-3.2E-10
NMISA							-8.9E-09	-8.0E-09	-1.2E-08	-1.2E-08	-3.2E-09
NPL								-5.6E-09	-9.5E-09	-9.3E-09	-7.5E-10
NRC									-8.6E-09	-8.4E-09	1.5E-10
PTB										-1.2E-08	-3.7E-09
VNIIOFI											-3.5E-09



The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter A, 500 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-6.2E-09	-6.0E-09	-8.9E-09	-7.8E-09	-6.9E-09	-8.6E-09	-6.1E-09	-5.0E-09	-8.8E-09	-8.6E-09	-1.1E-09
KRISS		-5.8E-09	-8.8E-09	-7.6E-09	-6.7E-09	-8.4E-09	-5.9E-09	-4.8E-09	-8.6E-09	-8.4E-09	-8.8E-10
LNE			-8.5E-09	-7.4E-09	-6.5E-09	-8.2E-09	-5.7E-09	-4.6E-09	-8.4E-09	-8.2E-09	-6.7E-10
MKEH				-1.0E-08	-9.4E-09	-1.1E-08	-8.6E-09	-7.5E-09	-1.1E-08	-1.1E-08	-3.6E-09
NIST					-8.3E-09	-9.9E-09	-7.4E-09	-6.4E-09	-1.0E-08	-9.9E-09	-2.4E-09
NMIJ						-9.0E-09	-6.5E-09	-5.5E-09	-9.3E-09	-9.0E-09	-1.5E-09
NMISA							-8.2E-09	-7.1E-09	-1.1E-08	-1.1E-08	-3.2E-09
NPL								-4.6E-09	-8.5E-09	-8.2E-09	-7.2E-10
NRC									-7.4E-09	-7.1E-09	3.6E-10
PTB										-1.1E-08	-3.5E-09
VNIIOFI											-3.2E-09

Filter A, 600 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-7.0E-09	-3.4E-09	-8.0E-09	-7.0E-09	-6.2E-09	-7.9E-09	-5.7E-09	-4.2E-09	-7.7E-09	-7.7E-09	-1.0E-09
KRISS		-5.1E-09	-9.7E-09	-8.6E-09	-7.8E-09	-9.5E-09	-7.4E-09	-5.9E-09	-9.4E-09	-9.4E-09	-2.7E-09
LNE			-6.1E-09	-5.0E-09	-4.2E-09	-5.9E-09	-3.7E-09	-2.2E-09	-5.8E-09	-5.7E-09	9.3E-10
MKEH				-9.6E-09	-8.9E-09	-1.1E-08	-8.4E-09	-6.9E-09	-1.0E-08	-1.0E-08	-3.7E-09
NIST					-7.8E-09	-9.5E-09	-7.3E-09	-5.8E-09	-9.3E-09	-9.3E-09	-2.6E-09
NMIJ						-8.7E-09	-6.5E-09	-5.0E-09	-8.5E-09	-8.5E-09	-1.9E-09
NMISA							-8.2E-09	-6.7E-09	-1.0E-08	-1.0E-08	-3.5E-09
NPL								-4.6E-09	-8.1E-09	-8.1E-09	-1.4E-09
NRC									-6.6E-09	-6.6E-09	1.1E-10
PTB										-1.0E-08	-3.4E-09
VNIIOFI											-3.4E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter A, 700 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-6.5E-09	-2.9E-09	-7.6E-09	-6.5E-09	-5.7E-09	-7.4E-09	-5.5E-09	-3.4E-09	-7.2E-09	-7.4E-09	-5.4E-10
KRISS		-5.1E-09	-9.8E-09	-8.7E-09	-7.9E-09	-9.6E-09	-7.7E-09	-5.6E-09	-9.3E-09	-9.6E-09	-2.7E-09
LNE			-6.2E-09	-5.1E-09	-4.3E-09	-5.9E-09	-4.0E-09	-1.9E-09	-5.7E-09	-6.0E-09	9.1E-10
MKEH				-9.8E-09	-9.0E-09	-1.1E-08	-8.8E-09	-6.7E-09	-1.0E-08	-1.1E-08	-3.8E-09
NIST					-7.9E-09	-9.6E-09	-7.7E-09	-5.6E-09	-9.4E-09	-9.6E-09	-2.7E-09
NMIJ						-8.8E-09	-6.9E-09	-4.8E-09	-8.6E-09	-8.8E-09	-1.9E-09
NMISA							-8.5E-09	-6.4E-09	-1.0E-08	-1.0E-08	-3.6E-09
NPL								-4.5E-09	-8.3E-09	-8.6E-09	-1.7E-09
NRC									-6.2E-09	-6.5E-09	3.9E-10
PTB										-1.0E-08	-3.4E-09
VNIIOFI											-3.7E-09

Filter A, 800 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-8.1E-09	-4.1E-09	-8.7E-09	-7.6E-09	-6.7E-09	-8.6E-09	-6.1E-09	-4.8E-09	-8.0E-09	-8.6E-09	-1.8E-09
KRISS		-5.4E-09	-1.0E-08	-9.0E-09	-8.1E-09	-9.9E-09	-7.5E-09	-6.2E-09	-9.4E-09	-1.0E-08	-3.2E-09
LNE			-6.0E-09	-5.0E-09	-4.0E-09	-5.9E-09	-3.5E-09	-2.1E-09	-5.3E-09	-6.0E-09	8.8E-10
MKEH				-9.6E-09	-8.7E-09	-1.1E-08	-8.1E-09	-6.8E-09	-1.0E-08	-1.1E-08	-3.8E-09
NIST					-7.6E-09	-9.5E-09	-7.0E-09	-5.7E-09	-8.9E-09	-9.6E-09	-2.7E-09
NMIJ						-8.5E-09	-6.1E-09	-4.8E-09	-8.0E-09	-8.6E-09	-1.8E-09
NMISA							-8.0E-09	-6.6E-09	-9.8E-09	-1.0E-08	-3.6E-09
NPL								-4.2E-09	-7.4E-09	-8.1E-09	-1.2E-09
NRC									-6.1E-09	-6.7E-09	1.4E-10
PTB										-9.9E-09	-3.1E-09
VNIIOFI											-3.7E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter A, 900 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-7.6E-09	-5.9E-09	-8.7E-09	-7.6E-09	-6.8E-09	-6.0E-09	-5.6E-09	-4.1E-09	-8.1E-09	-8.7E-09	-1.4E-09
KRISS		-7.2E-09	-1.0E-08	-8.8E-09	-8.1E-09	-7.3E-09	-6.9E-09	-5.4E-09	-9.4E-09	-9.9E-09	-2.6E-09
LNE			-8.2E-09	-7.1E-09	-6.4E-09	-5.5E-09	-5.1E-09	-3.6E-09	-7.6E-09	-8.2E-09	-8.7E-10
MKEH				-9.9E-09	-9.2E-09	-8.3E-09	-7.9E-09	-6.5E-09	-1.0E-08	-1.1E-08	-3.7E-09
NIST					-8.0E-09	-7.2E-09	-6.8E-09	-5.3E-09	-9.3E-09	-9.9E-09	-2.5E-09
NMIJ						-6.5E-09	-6.1E-09	-4.6E-09	-8.6E-09	-9.1E-09	-1.8E-09
NMISA							-5.2E-09	-3.8E-09	-7.7E-09	-8.3E-09	-9.8E-10
NPL								-3.4E-09	-7.3E-09	-7.9E-09	-5.9E-10
NRC									-5.9E-09	-6.4E-09	8.8E-10
PTB										-1.0E-08	-3.1E-09
VNIIOFI											-3.7E-09

Filter A, 1000 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.9E-09	-5.3E-09	-8.0E-09	-6.8E-09	-6.0E-09	-7.6E-09	-4.6E-09	-4.3E-09	-7.5E-09	-8.0E-09	-2.8E-10
KRISS		-5.7E-09	-8.4E-09	-7.2E-09	-6.4E-09	-8.0E-09	-5.0E-09	-4.7E-09	-7.9E-09	-8.4E-09	-6.8E-10
LNE			-8.7E-09	-7.5E-09	-6.7E-09	-8.3E-09	-5.4E-09	-5.1E-09	-8.3E-09	-8.7E-09	-1.0E-09
MKEH				-1.0E-08	-9.4E-09	-1.1E-08	-8.1E-09	-7.8E-09	-1.1E-08	-1.1E-08	-3.7E-09
NIST					-8.2E-09	-9.8E-09	-6.9E-09	-6.6E-09	-9.8E-09	-1.0E-08	-2.5E-09
NMIJ						-9.0E-09	-6.0E-09	-5.7E-09	-9.0E-09	-9.4E-09	-1.7E-09
NMISA							-7.6E-09	-7.3E-09	-1.1E-08	-1.1E-08	-3.3E-09
NPL								-4.4E-09	-7.6E-09	-8.0E-09	-3.5E-10
NRC									-7.3E-09	-7.7E-09	-4.7E-11
PTB										-1.1E-08	-3.3E-09
VNIIOFI											-3.7E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter B, 380 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-6.7E-08	-4.9E-08	-8.3E-08	-5.1E-08	-8.1E-08	-7.8E-08	-8.2E-08	-2.8E-08	-3.4E-08	-7.8E-08	-4.1E-08
KRISS		-4.9E-08	-8.3E-08	-5.1E-08	-8.1E-08	-7.8E-08	-8.2E-08	-2.8E-08	-3.4E-08	-7.8E-08	-4.1E-08
LNE			-6.6E-08	-3.3E-08	-6.4E-08	-6.0E-08	-6.4E-08	-1.1E-08	-1.7E-08	-6.0E-08	-2.3E-08
MKEH				-6.8E-08	-9.8E-08	-9.5E-08	-9.8E-08	-4.5E-08	-5.1E-08	-9.4E-08	-5.7E-08
NIST					-6.6E-08	-6.3E-08	-6.6E-08	-1.3E-08	-1.9E-08	-6.2E-08	-2.5E-08
NMIJ						-9.3E-08	-9.7E-08	-4.3E-08	-4.9E-08	-9.2E-08	-5.5E-08
NMISA							-9.3E-08	-4.0E-08	-4.6E-08	-8.9E-08	-3.8E-08
NPL								-4.3E-08	-4.9E-08	-9.3E-08	-5.6E-08
NRC									4.1E-09	-3.9E-08	-2.0E-09
PTB										-4.5E-08	-8.1E-09
VNIIOFI											-5.1E-08

Filter B, 400 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.5E-09	-6.1E-09	-7.3E-09	-4.3E-09	-5.4E-09	-7.2E-09	-6.9E-09	-3.0E-09	-6.2E-09	-7.1E-09	-1.2E-09
KRISS		-4.7E-09	-6.0E-09	-3.1E-09	-4.1E-09	-5.9E-09	-5.8E-09	-1.8E-09	-5.0E-09	-5.7E-09	-1.7E-10
LNE			-7.6E-09	-4.7E-09	-5.7E-09	-7.5E-09	-7.3E-09	-3.4E-09	-6.6E-09	-7.3E-09	-1.8E-09
MKEH				-5.9E-09	-7.0E-09	-8.8E-09	-8.5E-09	-4.6E-09	-7.8E-09	-8.6E-09	-2.9E-09
NIST					-4.0E-09	-5.7E-09	-5.4E-09	-1.6E-09	-4.7E-09	-5.7E-09	2.6E-10
NMIJ						-6.8E-09	-6.6E-09	-2.7E-09	-5.8E-09	-6.7E-09	-9.5E-10
NMISA							-8.3E-09	-4.5E-09	-7.6E-09	-8.5E-09	-2.3E-09
NPL								-4.2E-09	-7.3E-09	-8.4E-09	-2.2E-09
NRC									-3.5E-09	-4.3E-09	1.4E-09
PTB										-7.5E-09	-1.6E-09
VNIIOFI											-2.8E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter B, 500 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-3.1E-09	-4.7E-09	-3.3E-09	-4.3E-09	-4.8E-09	-5.3E-09	-5.1E-09	-2.5E-09	-5.1E-09	-5.4E-09	-7.7E-10
KRISS		-3.3E-09	-1.8E-09	-2.9E-09	-3.4E-09	-3.9E-09	-3.7E-09	-1.0E-09	-3.6E-09	-4.0E-09	6.3E-10
LNE			-3.5E-09	-4.6E-09	-5.0E-09	-5.5E-09	-5.4E-09	-2.7E-09	-5.3E-09	-5.6E-09	-1.0E-09
MKEH				-3.1E-09	-3.6E-09	-4.1E-09	-3.9E-09	-1.3E-09	-3.8E-09	-4.2E-09	4.3E-10
NIST					-4.7E-09	-5.2E-09	-5.0E-09	-2.3E-09	-4.9E-09	-5.3E-09	-6.2E-10
NMIJ						-5.6E-09	-5.5E-09	-2.8E-09	-5.4E-09	-5.8E-09	-1.1E-09
NMISA							-5.9E-09	-3.3E-09	-5.9E-09	-6.3E-09	-1.5E-09
NPL								-3.1E-09	-5.7E-09	-6.1E-09	-1.4E-09
NRC									-3.1E-09	-3.4E-09	1.2E-09
PTB										-6.0E-09	-1.3E-09
VNIIOFI											-1.8E-09

Filter B, 600 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.4E-09	-3.1E-09	-2.3E-09	-3.9E-09	-3.2E-09	-4.0E-09	-3.6E-09	-1.7E-09	-3.4E-09	-3.9E-09	-6.7E-10
KRISS		-2.3E-09	-1.5E-09	-3.1E-09	-2.5E-09	-3.2E-09	-2.8E-09	-9.0E-10	-2.6E-09	-3.1E-09	9.2E-11
LNE			-2.2E-09	-3.8E-09	-3.1E-09	-3.8E-09	-3.4E-09	-1.5E-09	-3.3E-09	-3.8E-09	-5.3E-10
MKEH				-3.0E-09	-2.4E-09	-3.1E-09	-2.7E-09	-8.0E-10	-2.5E-09	-3.0E-09	2.0E-10
NIST					-3.9E-09	-4.7E-09	-4.3E-09	-2.4E-09	-4.1E-09	-4.6E-09	-1.4E-09
NMIJ						-4.0E-09	-3.6E-09	-1.7E-09	-3.4E-09	-3.9E-09	-7.0E-10
NMISA							-4.3E-09	-2.5E-09	-4.2E-09	-4.7E-09	-1.3E-09
NPL								-2.0E-09	-3.8E-09	-4.3E-09	-1.0E-09
NRC									-1.9E-09	-2.4E-09	8.6E-10
PTB										-4.1E-09	-8.6E-10
VNIIOFI											-1.4E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter B, 700 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.2E-09	-2.9E-09	-2.2E-09	-4.2E-09	-3.2E-09	-3.9E-09	-3.6E-09	-1.6E-09	-3.4E-09	-3.9E-09	-3.8E-10
KRISS		-2.2E-09	-1.4E-09	-3.4E-09	-2.4E-09	-3.2E-09	-2.9E-09	-8.7E-10	-2.7E-09	-3.1E-09	3.5E-10
LNE			-2.2E-09	-4.2E-09	-3.2E-09	-3.9E-09	-3.7E-09	-1.6E-09	-3.5E-09	-3.9E-09	-4.2E-10
MKEH				-3.4E-09	-2.5E-09	-3.2E-09	-2.9E-09	-9.1E-10	-2.7E-09	-3.1E-09	3.3E-10
NIST					-4.5E-09	-5.2E-09	-4.9E-09	-2.9E-09	-4.7E-09	-5.1E-09	-1.6E-09
NMIJ						-4.2E-09	-3.9E-09	-1.9E-09	-3.7E-09	-4.2E-09	-6.9E-10
NMISA							-4.6E-09	-2.6E-09	-4.4E-09	-4.9E-09	-1.4E-09
NPL								-2.3E-09	-4.1E-09	-4.6E-09	-1.1E-09
NRC									-2.2E-09	-2.6E-09	8.9E-10
PTB										-4.4E-09	-9.0E-10
VNIIOFI											-1.4E-09

Filter B, 800 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.0E-09	-3.8E-09	-2.6E-09	-4.8E-09	-4.1E-09	-4.8E-09	-4.6E-09	-2.1E-09	-3.7E-09	-4.8E-09	-6.6E-10
KRISS		-2.0E-09	-8.6E-10	-3.0E-09	-2.4E-09	-3.1E-09	-2.8E-09	-4.0E-10	-2.0E-09	-3.1E-09	1.1E-09
LNE			-2.6E-09	-4.8E-09	-4.2E-09	-4.8E-09	-4.6E-09	-2.2E-09	-3.7E-09	-4.9E-09	-7.3E-10
MKEH				-3.7E-09	-3.0E-09	-3.7E-09	-3.4E-09	-1.0E-09	-2.6E-09	-3.7E-09	4.5E-10
NIST					-5.2E-09	-5.8E-09	-5.6E-09	-3.2E-09	-4.7E-09	-5.9E-09	-1.7E-09
NMIJ						-5.2E-09	-5.0E-09	-2.6E-09	-4.1E-09	-5.3E-09	-1.1E-09
NMISA							-5.6E-09	-3.2E-09	-4.8E-09	-5.9E-09	-1.5E-09
NPL								-3.0E-09	-4.5E-09	-5.7E-09	-1.5E-09
NRC									-2.1E-09	-3.3E-09	9.1E-10
PTB										-4.8E-09	-6.3E-10
VNIIOFI											-1.8E-09

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter B, 900 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.6E-09	-1.6E-09	-6.4E-10	-2.4E-09	-2.0E-09	-1.7E-09	-2.2E-09	-8.5E-10	-2.1E-09	-2.4E-09	4.6E-10
KRISS		-2.4E-09	-1.4E-09	-3.1E-09	-2.8E-09	-2.5E-09	-3.0E-09	-1.6E-09	-2.9E-09	-3.2E-09	-3.5E-10
LNE			-1.4E-09	-3.1E-09	-2.7E-09	-2.5E-09	-3.0E-09	-1.6E-09	-2.8E-09	-3.1E-09	-3.1E-10
MKEH				-2.1E-09	-1.8E-09	-1.5E-09	-2.0E-09	-6.4E-10	-1.8E-09	-2.2E-09	6.6E-10
NIST					-3.5E-09	-3.2E-09	-3.7E-09	-2.4E-09	-3.6E-09	-3.9E-09	-1.1E-09
NMIJ						-2.9E-09	-3.4E-09	-2.0E-09	-3.2E-09	-3.5E-09	-6.7E-10
NMISA							-3.1E-09	-1.7E-09	-3.0E-09	-3.3E-09	-2.6E-10
NPL								-2.2E-09	-3.4E-09	-3.8E-09	-9.2E-10
NRC									-2.1E-09	-2.4E-09	4.5E-10
PTB										-3.6E-09	-7.5E-10
VNIIOFI											-1.1E-09

Filter B, 1000 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-3.1E-10	-1.6E-09	-9.0E-10	-1.8E-09	-1.4E-09	-1.8E-09	-1.5E-09	-8.6E-10	-1.6E-09	-1.8E-09	2.2E-11
KRISS		-7.7E-10	-9.0E-11	-9.8E-10	-6.0E-10	-1.0E-09	-7.5E-10	-4.9E-11	-8.0E-10	-1.0E-09	8.1E-10
LNE			-1.4E-09	-2.3E-09	-1.9E-09	-2.3E-09	-2.0E-09	-1.3E-09	-2.1E-09	-2.3E-09	-4.7E-10
MKEH				-1.6E-09	-1.2E-09	-1.6E-09	-1.3E-09	-6.4E-10	-1.4E-09	-1.6E-09	2.3E-10
NIST					-2.1E-09	-2.5E-09	-2.2E-09	-1.5E-09	-2.3E-09	-2.5E-09	-6.4E-10
NMIJ						-2.1E-09	-1.8E-09	-1.1E-09	-1.9E-09	-2.1E-09	-2.7E-10
NMISA							-2.2E-09	-1.6E-09	-2.3E-09	-2.5E-09	-6.1E-10
NPL								-1.3E-09	-2.0E-09	-2.3E-09	-3.9E-10
NRC									-1.3E-09	-1.6E-09	2.8E-10
PTB										-2.3E-09	-4.6E-10
VNIIOFI											-7.2E-10

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter C, 380 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-5.0E-09	-2.7E-09	-3.3E-09	-3.3E-09	-5.2E-09	-4.0E-09	-5.3E-09	-3.0E-09	-1.7E-09	-5.3E-09	-2.7E-09
KRISS		-3.3E-09	-3.9E-09	-3.9E-09	-5.8E-09	-4.6E-09	-5.9E-09	-3.6E-09	-2.3E-09	-5.9E-09	-3.4E-09
LNE			-1.6E-09	-1.6E-09	-3.5E-09	-2.3E-09	-3.6E-09	-1.3E-09	2.5E-11	-3.5E-09	-1.0E-09
MKEH				-2.3E-09	-4.1E-09	-3.0E-09	-4.3E-09	-2.0E-09	-6.5E-10	-4.2E-09	-1.6E-09
NIST					-4.1E-09	-3.0E-09	-4.3E-09	-2.0E-09	-6.4E-10	-4.2E-09	-1.7E-09
NMIJ						-4.8E-09	-6.1E-09	-3.8E-09	-2.5E-09	-6.0E-09	-3.6E-09
NMISA							-4.9E-09	-2.7E-09	-1.3E-09	-4.9E-09	-2.3E-09
NPL								-4.0E-09	-2.6E-09	-6.2E-09	-3.7E-09
NRC									-3.5E-10	-3.9E-09	-1.5E-09
PTB										-2.6E-09	1.5E-11
VNIIOFI											-3.5E-09

Filter C, 400 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-7.2E-10	-1.1E-09	-1.2E-09	-6.6E-10	-8.4E-10	-1.2E-09	-1.2E-09	-1.2E-09	-4.3E-10	-1.2E-09	-3.8E-10
KRISS		-8.4E-10	-9.5E-10	-4.1E-10	-5.8E-10	-9.3E-10	-9.1E-10	-9.0E-10	-1.7E-10	-9.1E-10	-1.6E-10
LNE			-1.3E-09	-7.8E-10	-9.5E-10	-1.3E-09	-1.3E-09	-1.3E-09	-5.4E-10	-1.3E-09	-4.9E-10
MKEH				-9.0E-10	-1.1E-09	-1.4E-09	-1.4E-09	-1.4E-09	-6.5E-10	-1.4E-09	-6.1E-10
NIST					-5.2E-10	-8.7E-10	-8.6E-10	-8.5E-10	-1.1E-10	-8.5E-10	-6.2E-11
NMIJ						-1.0E-09	-1.0E-09	-1.0E-09	-2.8E-10	-1.0E-09	-2.8E-10
NMISA							-1.4E-09	-1.4E-09	-6.2E-10	-1.4E-09	-5.8E-10
NPL								-1.3E-09	-6.1E-10	-1.4E-09	-6.1E-10
NRC									-6.0E-10	-1.3E-09	-6.0E-10
PTB										-6.0E-10	1.7E-10
VNIIOFI											-5.6E-10



The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter C, 500 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-3.2E-10	-4.3E-10	-2.6E-10	-2.7E-10	-3.1E-10	-4.4E-10	-4.4E-10	-4.6E-10	-1.5E-10	-4.4E-10	-1.3E-10
KRISS		-3.5E-10	-1.9E-10	-2.0E-10	-2.3E-10	-3.7E-10	-3.6E-10	-3.8E-10	-7.1E-11	-3.6E-10	-5.2E-11
LNE			-3.0E-10	-3.1E-10	-3.4E-10	-4.8E-10	-4.8E-10	-4.9E-10	-1.8E-10	-4.8E-10	-1.6E-10
MKEH				-1.5E-10	-1.8E-10	-3.2E-10	-3.1E-10	-3.3E-10	-2.0E-11	-3.1E-10	6.0E-13
NIST					-1.9E-10	-3.3E-10	-3.2E-10	-3.4E-10	-2.8E-11	-3.2E-10	-7.9E-12
NMIJ						-3.6E-10	-3.6E-10	-3.7E-10	-6.3E-11	-3.5E-10	-4.4E-11
NMISA							-4.9E-10	-5.1E-10	-2.0E-10	-4.9E-10	-1.8E-10
NPL								-5.0E-10	-2.0E-10	-4.9E-10	-1.7E-10
NRC									-2.1E-10	-5.0E-10	-1.9E-10
PTB										-1.9E-10	1.2E-10
VNIIOFI											-1.7E-10

Filter C, 600 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-3.3E-10	-3.7E-10	-2.6E-10	-2.6E-10	-2.7E-10	-3.9E-10	-2.1E-10	-2.1E-10	-1.8E-10	-3.7E-10	-1.8E-10
KRISS		-3.5E-10	-2.4E-10	-2.4E-10	-2.6E-10	-3.7E-10	-2.0E-10	-2.0E-10	-1.6E-10	-3.6E-10	-1.6E-10
LNE			-2.8E-10	-2.9E-10	-3.0E-10	-4.1E-10	-2.4E-10	-2.4E-10	-2.0E-10	-4.0E-10	-2.0E-10
MKEH				-1.8E-10	-1.9E-10	-3.0E-10	-1.3E-10	-1.3E-10	-9.3E-11	-2.9E-10	-9.3E-11
NIST					-1.9E-10	-3.0E-10	-1.3E-10	-1.3E-10	-9.5E-11	-2.9E-10	-9.5E-11
NMIJ						-3.2E-10	-1.5E-10	-1.5E-10	-1.1E-10	-3.1E-10	-1.1E-10
NMISA							-2.6E-10	-2.6E-10	-2.2E-10	-4.2E-10	-2.2E-10
NPL								-8.4E-11	-4.7E-11	-2.4E-10	-4.8E-11
NRC									-4.9E-11	-2.5E-10	-5.1E-11
PTB										-2.1E-10	-1.3E-11
VNIIOFI											-2.0E-10

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter C, 700 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.0E-09	-1.6E-09	-1.8E-09	-7.9E-10	-1.5E-09	-1.8E-09	-1.8E-09	-1.6E-09	-5.6E-10	-1.7E-09	-8.0E-10
KRISS		-1.2E-09	-1.4E-09	-3.3E-10	-1.0E-09	-1.3E-09	-1.3E-09	-1.2E-09	-9.8E-11	-1.3E-09	-3.4E-10
LNE			-2.0E-09	-9.6E-10	-1.7E-09	-2.0E-09	-2.0E-09	-1.8E-09	-7.3E-10	-1.9E-09	-9.7E-10
MKEH				-1.2E-09	-1.8E-09	-2.2E-09	-2.1E-09	-2.0E-09	-9.2E-10	-2.1E-09	-1.2E-09
NIST					-8.1E-10	-1.1E-09	-1.1E-09	-9.6E-10	1.1E-10	-1.1E-09	-1.3E-10
NMIJ						-1.8E-09	-1.8E-09	-1.7E-09	-5.8E-10	-1.8E-09	-8.2E-10
NMISA							-2.1E-09	-2.0E-09	-9.0E-10	-2.1E-09	-1.1E-09
NPL								-2.0E-09	-8.9E-10	-2.1E-09	-1.1E-09
NRC									-7.3E-10	-1.9E-09	-1.0E-09
PTB										-8.4E-10	9.7E-11
VNIIOFI											-1.1E-09

Filter C, 800 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.8E-10	-6.7E-10	-4.1E-10	-4.7E-10	-4.7E-10	-7.0E-10	-6.8E-10	-5.0E-10	-3.5E-10	-6.9E-10	-1.9E-10
KRISS		-4.0E-10	-1.4E-10	-1.9E-10	-1.9E-10	-4.3E-10	-4.1E-10	-2.3E-10	-7.3E-11	-4.2E-10	8.8E-11
LNE			-5.3E-10	-5.8E-10	-5.8E-10	-8.2E-10	-8.0E-10	-6.2E-10	-4.6E-10	-8.1E-10	-3.0E-10
MKEH				-3.2E-10	-3.2E-10	-5.5E-10	-5.4E-10	-3.6E-10	-2.0E-10	-5.4E-10	-2.1E-11
NIST					-3.8E-10	-6.1E-10	-6.0E-10	-4.2E-10	-2.6E-10	-6.0E-10	-9.8E-11
NMIJ						-6.1E-10	-5.9E-10	-4.1E-10	-2.6E-10	-6.0E-10	-9.7E-11
NMISA							-8.3E-10	-6.5E-10	-4.9E-10	-8.3E-10	-3.3E-10
NPL								-6.3E-10	-4.7E-10	-8.2E-10	-3.1E-10
NRC									-2.9E-10	-6.3E-10	-1.3E-10
PTB										-4.8E-10	4.2E-11
VNIIOFI											-3.0E-10

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter C, 900 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.4E-10	-4.1E-10	-4.4E-10	-2.9E-10	-2.7E-10	-1.1E-10	-4.3E-10	-2.7E-10	-1.8E-10	-4.3E-10	-9.6E-11
KRISS		-3.2E-10	-3.6E-10	-2.0E-10	-1.8E-10	-2.8E-11	-3.4E-10	-1.8E-10	-9.2E-11	-3.4E-10	-2.3E-11
LNE			-5.2E-10	-3.7E-10	-3.5E-10	-1.9E-10	-5.1E-10	-3.5E-10	-2.6E-10	-5.1E-10	-1.9E-10
MKEH				-4.0E-10	-3.8E-10	-2.3E-10	-5.4E-10	-3.8E-10	-2.9E-10	-5.4E-10	-2.1E-10
NIST					-2.3E-10	-7.1E-11	-3.9E-10	-2.3E-10	-1.3E-10	-3.9E-10	-5.4E-11
NMIJ						-5.5E-11	-3.7E-10	-2.1E-10	-1.2E-10	-3.7E-10	-5.1E-11
NMISA							-2.1E-10	-5.4E-11	3.9E-11	-2.1E-10	1.1E-10
NPL								-3.7E-10	-2.8E-10	-5.3E-10	-2.1E-10
NRC									-1.2E-10	-3.7E-10	-4.9E-11
PTB										-2.8E-10	5.7E-11
VNIIOFI											-2.0E-10

Filter C, 1000 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.3E-10	-2.2E-10	-1.2E-10	-1.0E-10	-1.6E-10	-9.8E-11	-1.8E-10	-1.2E-10	-2.3E-10	-2.2E-10	-5.8E-11
KRISS		-1.6E-10	-6.9E-11	-4.8E-11	-1.1E-10	-4.5E-11	-1.2E-10	-6.3E-11	-1.8E-10	-1.7E-10	-4.4E-12
LNE			-1.6E-10	-1.4E-10	-2.0E-10	-1.3E-10	-2.1E-10	-1.5E-10	-2.7E-10	-2.6E-10	-9.4E-11
MKEH				-4.4E-11	-1.1E-10	-4.0E-11	-1.2E-10	-5.8E-11	-1.7E-10	-1.7E-10	9.7E-13
NIST					-8.5E-11	-1.9E-11	-9.8E-11	-3.7E-11	-1.5E-10	-1.5E-10	2.2E-11
NMIJ						-8.2E-11	-1.6E-10	-1.0E-10	-2.1E-10	-2.1E-10	-4.2E-11
NMISA							-9.5E-11	-3.4E-11	-1.5E-10	-1.4E-10	2.5E-11
NPL								-1.1E-10	-2.3E-10	-2.2E-10	-5.4E-11
NRC									-1.7E-10	-1.6E-10	6.7E-12
PTB										-2.7E-10	-1.1E-10
VNIIOFI											-1.0E-10

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter D, 380 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-8.1E-12	-5.3E-12	-5.1E-12	-5.2E-12	-6.7E-12	-2.3E-12	-5.7E-12	-2.9E-12	-2.5E-12	-	-3.4E-12
KRISS		-7.4E-12	-7.1E-12	-7.2E-12	-8.7E-12	-4.3E-12	-7.7E-12	-4.9E-12	-4.5E-12	-	-5.4E-12
LNE			-4.3E-12	-4.5E-12	-5.9E-12	-1.6E-12	-4.9E-12	-2.1E-12	-1.8E-12	-	-3.3E-12
MKEH				-4.2E-12	-5.7E-12	-1.3E-12	-4.7E-12	-1.9E-12	-1.5E-12	-	-2.4E-12
NIST					-5.8E-12	-1.4E-12	-4.8E-12	-2.0E-12	-1.7E-12	-	-2.5E-12
NMIJ						-2.9E-12	-6.2E-12	-3.5E-12	-3.2E-12	-	-4.7E-12
NMISA							-1.9E-12	9.1E-13	1.2E-12	-	3.7E-13
NPL								-2.5E-12	-2.2E-12	-	-3.5E-12
NRC									6.7E-13	-	-1.9E-13
PTB										-	3.7E-13
VNIIOFI											-

Filter D, 400 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.9E-11	-1.7E-11	-1.8E-11	-1.8E-11	-2.1E-11	-1.8E-11	-2.7E-11	-2.2E-11	-1.1E-11	-2.8E-11	-1.4E-11
KRISS		-1.2E-11	-1.2E-11	-1.2E-11	-1.6E-11	-1.3E-11	-2.2E-11	-1.7E-11	-5.5E-12	-2.3E-11	-7.8E-12
LNE			-1.1E-11	-1.1E-11	-1.4E-11	-1.1E-11	-2.0E-11	-1.5E-11	-4.0E-12	-2.1E-11	-8.8E-12
MKEH				-1.1E-11	-1.4E-11	-1.2E-11	-2.0E-11	-1.6E-11	-4.3E-12	-2.2E-11	-6.6E-12
NIST					-1.5E-11	-1.2E-11	-2.1E-11	-1.6E-11	-4.5E-12	-2.2E-11	-6.8E-12
NMIJ						-1.5E-11	-2.4E-11	-1.9E-11	-7.8E-12	-2.5E-11	-1.3E-11
NMISA							-2.1E-11	-1.6E-11	-4.8E-12	-2.2E-11	-7.1E-12
NPL								-2.5E-11	-1.4E-11	-3.1E-11	-1.8E-11
NRC									-8.8E-12	-2.6E-11	-1.1E-11
PTB										-1.5E-11	1.4E-12
VNIIOFI											-1.8E-11

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter D, 500 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-7.0E-12	-8.6E-12	-5.7E-12	-5.7E-12	-5.2E-12	-5.7E-12	-5.5E-12	-8.7E-12	-6.1E-12	-9.4E-12	-2.3E-12
KRISS		-7.4E-12	-4.5E-12	-4.6E-12	-4.0E-12	-4.6E-12	-4.4E-12	-7.5E-12	-5.0E-12	-8.2E-12	-1.2E-12
LNE			-6.2E-12	-6.2E-12	-5.6E-12	-6.2E-12	-6.0E-12	-9.1E-12	-6.6E-12	-9.8E-12	-2.9E-12
MKEH				-3.3E-12	-2.8E-12	-3.3E-12	-3.1E-12	-6.2E-12	-3.7E-12	-6.9E-12	1.7E-13
NIST					-2.8E-12	-3.3E-12	-3.1E-12	-6.2E-12	-3.7E-12	-7.0E-12	7.6E-14
NMIJ						-2.8E-12	-2.6E-12	-5.7E-12	-3.2E-12	-6.4E-12	4.7E-13
NMISA							-3.1E-12	-6.2E-12	-3.7E-12	-7.0E-12	1.4E-13
NPL								-6.1E-12	-3.5E-12	-6.8E-12	2.4E-13
NRC									-6.7E-12	-9.9E-12	-2.8E-12
PTB										-7.4E-12	-1.9E-13
VNIIOFI											-3.5E-12

Filter D, 600 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.3E-11	-1.6E-11	-1.1E-11	-1.1E-11	-9.9E-12	-1.4E-11	-1.1E-11	-8.1E-12	-1.2E-11	-1.6E-11	-5.7E-12
KRISS		-1.6E-11	-1.0E-11	-1.0E-11	-9.8E-12	-1.4E-11	-1.0E-11	-8.0E-12	-1.2E-11	-1.6E-11	-5.6E-12
LNE			-1.3E-11	-1.3E-11	-1.2E-11	-1.6E-11	-1.3E-11	-1.1E-11	-1.5E-11	-1.9E-11	-8.9E-12
MKEH				-7.8E-12	-7.1E-12	-1.1E-11	-7.7E-12	-5.3E-12	-9.2E-12	-1.4E-11	-2.7E-12
NIST					-7.1E-12	-1.1E-11	-7.7E-12	-5.3E-12	-9.2E-12	-1.4E-11	-2.9E-12
NMIJ						-1.0E-11	-7.0E-12	-4.6E-12	-8.5E-12	-1.3E-11	-3.0E-12
NMISA							-1.1E-11	-8.7E-12	-1.3E-11	-1.7E-11	-6.2E-12
NPL								-5.3E-12	-9.1E-12	-1.4E-11	-3.3E-12
NRC									-6.7E-12	-1.1E-11	-2.5E-13
PTB										-1.5E-11	-3.6E-12
VNIIOFI											-8.7E-12

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter D, 700 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.5E-11	-9.7E-11	-6.3E-11	-6.4E-11	-7.5E-11	-1.0E-10	-1.1E-10	-7.9E-11	-4.4E-11	-1.0E-10	-4.5E-11
KRISS		-5.6E-11	-2.1E-11	-2.3E-11	-3.3E-11	-6.0E-11	-6.7E-11	-3.8E-11	-2.8E-12	-6.0E-11	-3.3E-12
LNE			-7.3E-11	-7.5E-11	-8.5E-11	-1.1E-10	-1.2E-10	-9.0E-11	-5.5E-11	-1.1E-10	-5.6E-11
MKEH				-4.0E-11	-5.1E-11	-7.7E-11	-8.4E-11	-5.5E-11	-2.0E-11	-7.7E-11	-2.0E-11
NIST					-5.3E-11	-7.9E-11	-8.6E-11	-5.7E-11	-2.2E-11	-7.9E-11	-2.3E-11
NMIJ						-8.9E-11	-9.7E-11	-6.7E-11	-3.2E-11	-8.9E-11	-3.4E-11
NMISA							-1.2E-10	-9.4E-11	-5.9E-11	-1.2E-10	-5.9E-11
NPL								-1.0E-10	-6.6E-11	-1.2E-10	-6.7E-11
NRC									-3.7E-11	-9.3E-11	-3.7E-11
PTB										-5.9E-11	-1.5E-12
VNIIOFI											-5.9E-11

Filter D, 800 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.3E-11	-4.8E-11	-5.4E-11	-3.8E-11	-3.4E-11	-4.2E-11	-5.1E-11	-2.4E-11	-3.5E-11	-5.4E-11	-1.1E-11
KRISS		-4.7E-11	-5.3E-11	-3.7E-11	-3.3E-11	-4.2E-11	-5.0E-11	-2.3E-11	-3.4E-11	-5.3E-11	-1.0E-11
LNE			-5.9E-11	-4.2E-11	-3.8E-11	-4.7E-11	-5.6E-11	-2.9E-11	-3.9E-11	-5.9E-11	-1.6E-11
MKEH				-4.8E-11	-4.4E-11	-5.3E-11	-6.2E-11	-3.5E-11	-4.5E-11	-6.5E-11	-2.2E-11
NIST					-2.8E-11	-3.7E-11	-4.5E-11	-1.8E-11	-2.9E-11	-4.8E-11	-5.6E-12
NMIJ						-3.3E-11	-4.1E-11	-1.4E-11	-2.5E-11	-4.4E-11	-2.0E-12
NMISA							-5.0E-11	-2.3E-11	-3.4E-11	-5.3E-11	-1.0E-11
NPL								-3.2E-11	-4.2E-11	-6.2E-11	-1.9E-11
NRC									-1.5E-11	-3.5E-11	8.4E-12
PTB										-4.5E-11	-1.9E-12
VNIIOFI											-2.2E-11

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter D, 900 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.1E-11	-3.0E-11	-3.3E-11	-1.9E-11	-2.4E-11	-2.6E-12	-3.2E-11	-1.3E-11	-2.4E-11	-3.4E-11	-5.0E-12
KRISS		-1.7E-11	-2.0E-11	-5.7E-12	-1.1E-11	1.1E-11	-1.8E-11	7.3E-13	-1.1E-11	-2.0E-11	8.3E-12
LNE			-3.9E-11	-2.5E-11	-3.0E-11	-8.9E-12	-3.8E-11	-1.9E-11	-3.0E-11	-4.0E-11	-1.2E-11
MKEH				-2.8E-11	-3.3E-11	-1.2E-11	-4.1E-11	-2.2E-11	-3.3E-11	-4.3E-11	-1.4E-11
NIST					-1.9E-11	2.3E-12	-2.7E-11	-7.6E-12	-1.9E-11	-2.9E-11	2.5E-13
NMIJ						-2.7E-12	-3.2E-11	-1.3E-11	-2.4E-11	-3.4E-11	-5.4E-12
NMISA							-1.0E-11	8.7E-12	-2.8E-12	-1.2E-11	1.6E-11
NPL								-2.0E-11	-3.2E-11	-4.1E-11	-1.3E-11
NRC									-1.3E-11	-2.2E-11	6.9E-12
PTB										-3.4E-11	-4.6E-12
VNIIOFI											-1.5E-11

Filter D, 1000 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.6E-11	-2.4E-11	-1.4E-11	-1.5E-11	-1.7E-11	-5.0E-12	-1.3E-11	-7.5E-12	-2.4E-11	-2.4E-11	-4.9E-12
KRISS		-2.3E-11	-1.3E-11	-1.4E-11	-1.6E-11	-4.2E-12	-1.2E-11	-6.6E-12	-2.4E-11	-2.3E-11	-4.0E-12
LNE			-2.1E-11	-2.2E-11	-2.4E-11	-1.2E-11	-2.0E-11	-1.4E-11	-3.1E-11	-3.1E-11	-1.2E-11
MKEH				-1.3E-11	-1.4E-11	-2.4E-12	-1.0E-11	-4.8E-12	-2.2E-11	-2.1E-11	-2.2E-12
NIST					-1.5E-11	-3.4E-12	-1.1E-11	-5.9E-12	-2.3E-11	-2.2E-11	-3.3E-12
NMIJ						-5.1E-12	-1.3E-11	-7.6E-12	-2.5E-11	-2.4E-11	-5.1E-12
NMISA							-8.7E-13	4.3E-12	-1.3E-11	-1.2E-11	7.0E-12
NPL								-3.3E-12	-2.0E-11	-2.0E-11	-6.9E-13
NRC									-1.5E-11	-1.5E-11	4.6E-12
PTB										-3.2E-11	-1.2E-11
VNIIOFI											-1.2E-11

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter E, 380 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.7E-14	-6.0E-14	-1.2E-14	-2.6E-14	-2.4E-14	-	-	-8.0E-14	-7.4E-14	-	-7.7E-15
KRISS		-1.1E-14	3.7E-14	2.3E-14	2.5E-14	-	-	-3.0E-14	-2.5E-14	-	4.4E-14
LNE			4.0E-15	-1.0E-14	-8.0E-15	-	-	-6.4E-14	-5.8E-14	-	9.4E-15
MKEH				3.8E-14	4.0E-14	-	-	-1.5E-14	-9.7E-15	-	5.6E-14
NIST					2.6E-14	-	-	-2.9E-14	-2.4E-14	-	4.0E-14
NMIJ						-	-	-2.8E-14	-2.2E-14	-	4.5E-14
NMISA							-	-	-	-	-
NPL								-	-	-	-
NRC									-7.7E-14	-	-1.3E-14
PTB										-	-7.2E-15
VNIIOFI											-

Filter E, 400 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.5E-13	-2.8E-13	-1.7E-13	-1.7E-13	-1.9E-13	-	-1.8E-13	-1.3E-13	-1.4E-13	-	-1.5E-13
KRISS		-2.8E-13	-1.8E-13	-1.8E-13	-1.9E-13	-	-1.9E-13	-1.4E-13	-1.5E-13	-	-1.4E-13
LNE			-2.0E-13	-2.0E-13	-2.2E-13	-	-2.2E-13	-1.6E-13	-1.7E-13	-	-1.6E-13
MKEH				-9.3E-14	-1.1E-13	-	-1.1E-13	-5.8E-14	-6.7E-14	-	-9.3E-14
NIST					-1.1E-13	-	-1.0E-13	-5.5E-14	-6.3E-14	-	-1.0E-13
NMIJ						-	-1.2E-13	-7.0E-14	-8.0E-14	-	-8.7E-14
NMISA							-	-	-	-	-
NPL								-6.9E-14	-7.8E-14	-	-1.1E-13
NRC									-2.8E-14	-	-4.1E-14
PTB										-	-5.8E-14
VNIIOFI											-



The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter E, 500 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-2.9E-13	-4.1E-13	-3.2E-13	-3.2E-13	-3.5E-13	-	-2.6E-13	-2.1E-13	-2.7E-13	-4.8E-13	-1.6E-13
KRISS		-2.9E-13	-2.0E-13	-2.0E-13	-2.3E-13	-	-1.4E-13	-8.8E-14	-1.5E-13	-3.6E-13	-4.1E-14
LNE			-3.2E-13	-3.2E-13	-3.5E-13	-	-2.6E-13	-2.1E-13	-2.6E-13	-4.8E-13	-1.6E-13
MKEH				-2.3E-13	-2.6E-13	-	-1.7E-13	-1.2E-13	-1.8E-13	-3.9E-13	-7.6E-14
NIST					-2.6E-13	-	-1.7E-13	-1.2E-13	-1.7E-13	-3.9E-13	-7.7E-14
NMIJ						-	-2.0E-13	-1.5E-13	-2.1E-13	-4.2E-13	-1.0E-13
NMISA							-	-	-	-	-
NPL								-6.0E-14	-1.2E-13	-3.3E-13	-1.8E-14
NRC									-6.6E-14	-2.8E-13	3.6E-14
PTB										-3.4E-13	-2.2E-14
VNIIOFI											-2.4E-13

Filter E, 600 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-3.8E-13	-4.4E-13	-3.0E-13	-2.9E-13	-3.3E-13	-	-3.8E-13	-1.9E-13	-2.7E-13	-4.5E-13	-2.1E-13
KRISS		-3.9E-13	-2.5E-13	-2.5E-13	-2.8E-13	-	-3.4E-13	-1.5E-13	-2.3E-13	-4.0E-13	-1.5E-13
LNE			-3.1E-13	-3.0E-13	-3.4E-13	-	-3.9E-13	-2.0E-13	-2.8E-13	-4.6E-13	-1.9E-13
MKEH				-1.6E-13	-2.0E-13	-	-2.5E-13	-6.2E-14	-1.4E-13	-3.2E-13	-9.5E-14
NIST					-1.9E-13	-	-2.5E-13	-5.9E-14	-1.4E-13	-3.1E-13	-1.0E-13
NMIJ						-	-2.9E-13	-9.5E-14	-1.8E-13	-3.5E-13	-1.1E-13
NMISA							-	-	-	-	-
NPL								-1.5E-13	-2.3E-13	-4.0E-13	-1.9E-13
NRC									-4.1E-14	-2.1E-13	1.6E-14
PTB										-2.9E-13	-6.9E-14
VNIIOFI											-2.5E-13

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter E, 700 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-5.4E-12	-7.8E-12	-5.0E-12	-4.9E-12	-4.3E-12	-	-8.6E-12	-6.3E-12	-3.0E-12	-7.8E-12	-3.4E-12
KRISS		-6.3E-12	-3.4E-12	-3.4E-12	-2.7E-12	-	-7.0E-12	-4.7E-12	-1.4E-12	-6.2E-12	-1.5E-12
LNE			-5.9E-12	-5.8E-12	-5.2E-12	-	-9.5E-12	-7.2E-12	-3.9E-12	-8.7E-12	-3.9E-12
MKEH				-2.9E-12	-2.3E-12	-	-6.6E-12	-4.3E-12	-1.0E-12	-5.8E-12	-1.8E-12
NIST					-2.3E-12	-	-6.5E-12	-4.2E-12	-9.3E-13	-5.7E-12	-2.1E-12
NMIJ						-	-5.9E-12	-3.6E-12	-3.4E-13	-5.1E-12	-7.2E-13
NMISA							-	-	-	-	-
NPL								-7.9E-12	-4.6E-12	-9.4E-12	-5.5E-12
NRC									-2.3E-12	-7.1E-12	-2.7E-12
PTB										-3.8E-12	2.1E-13
VNIIOFI											-4.6E-12

Filter E, 800 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-1.0E-11	-1.2E-11	-8.0E-12	-8.1E-12	-9.0E-12	-	-7.4E-12	-7.6E-12	-7.9E-12	-1.2E-11	-3.4E-12
KRISS		-1.1E-11	-7.3E-12	-7.3E-12	-8.2E-12	-	-6.7E-12	-6.8E-12	-7.1E-12	-1.2E-11	-2.7E-12
LNE			-8.8E-12	-8.9E-12	-9.7E-12	-	-8.2E-12	-8.3E-12	-8.6E-12	-1.3E-11	-4.1E-12
MKEH				-5.4E-12	-6.3E-12	-	-4.7E-12	-4.9E-12	-5.2E-12	-9.8E-12	-7.7E-13
NIST					-6.3E-12	-	-4.8E-12	-4.9E-12	-5.2E-12	-9.9E-12	-9.1E-13
NMIJ						-	-5.7E-12	-5.8E-12	-6.1E-12	-1.1E-11	-1.7E-12
NMISA							-	-	-	-	-
NPL								-4.3E-12	-4.5E-12	-9.2E-12	-1.3E-13
NRC									-4.7E-12	-9.3E-12	-2.5E-13
PTB										-9.6E-12	-5.6E-13
VNIIOFI											-5.2E-12

The following tables contain the covariances between the degrees of equivalence,  $u(\Delta_i, \Delta_j)$ , of all participating laboratories.

Filter E, 900 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.5E-12	-1.0E-11	-6.8E-12	-6.8E-12	-8.3E-12	-	-5.6E-12	-6.0E-12	-7.8E-12	-1.1E-11	-2.2E-12
KRISS		-6.8E-12	-3.3E-12	-3.3E-12	-4.8E-12	-	-2.1E-12	-2.5E-12	-4.3E-12	-7.7E-12	1.4E-12
LNE			-9.1E-12	-9.1E-12	-1.1E-11	-	-7.9E-12	-8.3E-12	-1.0E-11	-1.3E-11	-4.4E-12
MKEH				-5.6E-12	-7.1E-12	-	-4.3E-12	-4.7E-12	-6.5E-12	-9.9E-12	-9.1E-13
NIST					-7.1E-12	-	-4.4E-12	-4.8E-12	-6.6E-12	-9.9E-12	-1.0E-12
NMIJ						-	-5.9E-12	-6.3E-12	-8.1E-12	-1.1E-11	-2.5E-12
NMISA							-	-	-	-	-
NPL								-3.5E-12	-5.3E-12	-8.7E-12	2.8E-13
NRC									-5.7E-12	-9.1E-12	-6.7E-14
PTB										-1.1E-11	-1.9E-12
VNIIOFI											-5.3E-12

Filter E, 1000 nm.

$u(\Delta_i, \Delta_j)$	KRISS	LNE	MKEH	NIST	NMIJ	NMISA	NPL	NRC	PTB	VNIIOFI	MSL
ASTAR	-4.2E-12	-8.7E-12	-5.8E-12	-5.8E-12	-4.1E-12	-	-4.2E-12	-3.3E-12	-6.8E-12	-9.1E-12	-2.2E-12
KRISS		-6.4E-12	-3.5E-12	-3.5E-12	-1.8E-12	-	-1.9E-12	-9.8E-13	-4.5E-12	-6.8E-12	6.4E-14
LNE			-7.9E-12	-7.9E-12	-6.3E-12	-	-6.3E-12	-5.4E-12	-9.0E-12	-1.1E-11	-4.3E-12
MKEH				-5.0E-12	-3.4E-12	-	-3.4E-12	-2.5E-12	-6.0E-12	-8.3E-12	-1.5E-12
NIST					-3.4E-12	-	-3.4E-12	-2.5E-12	-6.0E-12	-8.3E-12	-1.6E-12
NMIJ						-	-1.8E-12	-8.7E-13	-4.4E-12	-6.7E-12	1.8E-13
NMISA							-	-	-	-	-
NPL								-9.0E-13	-4.4E-12	-6.7E-12	9.3E-14
NRC									-3.5E-12	-5.8E-12	1.1E-12
PTB										-9.3E-12	-2.5E-12
VNIIOFI											-4.8E-12

The following tables contain the covariances between the degrees of equivalence of a participant and a measurement made with the same correlated component of uncertainty,  $u(\Delta_i, y_{i,f,r})$ , of all participating laboratories.

Filter A

$u(\Delta_i, y_{i,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	3.4E-08	3.6E-08	3.6E-08	3.7E-08	3.7E-08	3.6E-08	3.6E-08	3.7E-08
KRISS	1.7E-06	1.5E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06
LNE	1.2E-08	3.9E-09	3.8E-09	3.8E-09	3.8E-09	3.8E-09	3.8E-09	5.8E-09
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	1.7E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
NMIJ	4.4E-08	4.4E-08	4.3E-08	4.3E-08	4.3E-08	4.3E-08	4.6E-08	4.2E-08
NMISA	1.3E-05	1.9E-05	1.7E-05	1.6E-05	1.6E-05	2.5E-05	2.0E-04	4.5E-04
NPL	1.6E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
NRC	7.2E-09	5.8E-09	3.9E-09	4.6E-09	4.7E-09	4.8E-09	2.6E-09	4.5E-09
PTB	7.1E-08	7.3E-08	7.3E-08	7.4E-08	7.4E-08	7.5E-08	7.4E-08	7.6E-08
VNIIOFI	2.3E-07	1.6E-06	1.6E-06	9.2E-07	5.5E-07	6.1E-07	5.0E-07	1.3E-06
MSL	9.6E-12	1.9E-12	9.5E-13	6.3E-12	1.0E-12	1.0E-12	2.5E-12	1.2E-12

Filter B

$u(\Delta_i, y_{i,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	7.9E-07	2.1E-08	1.8E-08	2.2E-08	2.3E-08	2.0E-08	1.4E-08	1.1E-08
KRISS	3.5E-06	6.9E-07	6.6E-07	5.9E-07	6.6E-07	5.2E-07	4.8E-07	3.7E-07
LNE	6.9E-09	1.2E-08	1.2E-08	1.3E-08	1.3E-08	1.2E-08	1.2E-08	5.9E-09
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	1.5E-08	3.0E-08	2.8E-08	2.4E-08	2.9E-08	1.9E-08	1.1E-08	6.8E-09
NMIJ	7.6E-07	4.2E-08	4.2E-08	3.8E-08	4.4E-08	4.9E-08	3.5E-08	2.2E-08
NMISA	1.3E-05	1.9E-05	1.7E-05	1.7E-05	1.6E-05	2.5E-05	2.0E-04	4.6E-04
NPL	8.5E-07	2.3E-08	1.1E-08	1.0E-08	1.1E-08	1.5E-08	9.8E-09	5.3E-09
NRC	2.4E-08	2.8E-09	2.8E-09	3.2E-09	3.1E-09	3.6E-09	3.0E-09	2.5E-09
PTB	3.9E-09	1.2E-08	1.2E-08	1.2E-08	1.4E-08	1.1E-08	7.1E-09	3.3E-08
VNIIOFI	1.2E-06	4.1E-07	2.4E-07	1.6E-07	1.8E-07	2.3E-07	1.9E-07	2.9E-07
MSL	1.7E-07	1.2E-09	1.6E-10	4.3E-10	2.2E-10	7.5E-10	5.2E-10	2.2E-10

The following tables contain the covariances between the degrees of equivalence of a participant and a measurement made with the same correlated component of uncertainty,  $u(\Delta_i, y_{i,f,r})$ , of all participating laboratories.

Filter C

$u(\Delta_i, y_{i,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	3.3E-08	8.2E-09	2.2E-09	2.9E-09	1.4E-08	3.4E-09	2.2E-09	1.5E-09
KRISS	1.7E-07	5.7E-08	1.7E-08	1.9E-08	4.9E-08	4.0E-08	2.0E-08	1.5E-08
LNE	3.6E-10	4.8E-09	4.9E-09	3.6E-09	1.3E-08	1.2E-08	6.2E-09	3.6E-09
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	8.7E-12	2.2E-11	1.4E-11	7.3E-12	1.1E-10	1.0E-10	2.0E-11	6.1E-12
NMIJ	5.4E-08	6.2E-09	3.4E-09	1.3E-09	4.3E-08	7.4E-09	1.8E-09	1.3E-09
NMISA	1.4E-05	2.1E-05	1.7E-05	2.1E-05	1.7E-05	2.5E-05	2.0E-04	4.5E-04
NPL	6.2E-08	1.1E-08	1.7E-09	7.4E-10	2.2E-08	4.0E-09	1.8E-09	4.5E-10
NRC	6.1E-09	5.2E-09	3.2E-09	3.6E-10	5.9E-09	1.5E-09	6.8E-10	2.3E-10
PTB	5.0E-11	8.1E-10	1.5E-10	1.6E-10	5.1E-10	4.1E-10	1.9E-10	1.8E-09
VNIIOFI	1.2E-06	8.9E-09	2.4E-09	9.4E-09	2.1E-08	1.3E-08	8.2E-09	1.2E-08
MSL	5.9E-09	1.4E-09	1.9E-10	2.6E-10	2.3E-09	3.3E-10	1.7E-10	4.5E-11

Filter D

$u(\Delta_i, y_{i,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	3.6E-11	1.3E-10	5.7E-11	9.6E-11	1.4E-09	4.1E-10	2.1E-10	1.1E-10
KRISS	4.8E-10	4.9E-10	2.5E-10	4.7E-10	1.7E-09	2.0E-09	8.0E-10	6.9E-10
LNE	2.0E-12	3.1E-11	1.0E-10	9.4E-11	5.2E-10	8.4E-10	6.7E-10	3.9E-10
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	1.1E-13	1.2E-13	1.2E-13	1.2E-13	1.1E-12	2.2E-12	6.7E-13	2.6E-13
NMIJ	1.7E-10	6.1E-10	1.2E-10	1.4E-10	3.3E-09	1.5E-09	3.5E-09	4.0E-10
NMISA	1.8E-05	4.0E-05	1.9E-05	3.4E-05	2.1E-05	2.6E-05	2.7E-04	4.8E-04
NPL	7.0E-11	2.9E-10	1.4E-11	2.8E-11	1.2E-09	1.5E-10	1.1E-10	2.8E-11
NRC	1.6E-06	7.1E-06	5.1E-06	4.0E-06	1.6E-05	9.4E-06	6.7E-06	3.9E-06
PTB	2.0E-14	5.1E-12	1.7E-11	2.1E-11	8.4E-11	2.0E-10	8.8E-11	1.6E-10
VNIIOFI	-	1.6E-08	7.6E-11	4.3E-10	8.3E-10	4.3E-10	1.3E-10	4.1E-10
MSL	5.2E-12	3.2E-11	2.5E-12	1.2E-11	1.4E-10	1.3E-11	1.1E-11	3.4E-12

The following tables contain the covariances between the degrees of equivalence of a participant and a measurement made with the same correlated component of uncertainty,  $u(\Delta_i, y_{i,f,r})$ , of all participating laboratories.

Filter E

$u(\Delta_i, y_{i,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	6.2E-14	1.0E-12	1.2E-12	2.5E-12	9.7E-11	5.0E-11	3.0E-11	2.0E-11
KRISS	8.7E-13	5.8E-11	4.0E-12	9.6E-12	7.9E-11	1.6E-10	1.3E-10	1.3E-10
LNE	1.4E-14	9.0E-13	3.2E-12	3.9E-12	2.8E-11	1.3E-10	1.2E-10	8.4E-11
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	2.0E-14	2.0E-14	2.0E-14	2.0E-14	3.1E-14	1.7E-13	1.1E-13	6.4E-14
NMIJ	5.3E-12	7.6E-12	1.0E-11	1.2E-11	3.7E-10	8.6E-10	1.2E-09	4.8E-10
NMISA	-	-	-	-	-	-	-	-
NPL	-	4.2E-12	3.2E-13	8.1E-13	8.7E-11	1.4E-11	1.3E-11	6.4E-12
NRC	6.2E-16	2.5E-14	1.0E-13	1.7E-13	2.1E-11	1.7E-11	7.1E-12	2.7E-12
PTB	4.0E-17	2.9E-14	2.5E-13	3.6E-13	4.6E-12	1.5E-11	1.9E-11	3.0E-11
VNIIOFI	-	-	6.6E-11	1.0E-10	5.3E-11	2.9E-10	3.2E-10	2.1E-10
MSL	1.7E-14	2.5E-13	5.5E-14	3.3E-13	9.8E-12	1.2E-12	9.4E-13	1.3E-12

The following tables contain the covariances between a measurement of a participant and the degrees of equivalence of any other participant,  $u(\Delta_i, y_{j,f,r}), i \neq j$ , for all participating laboratories.

Filter A

$u(\Delta_i, y_{j,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	-5.1E-09	-3.2E-09	-2.7E-09	-2.0E-09	-1.8E-09	-2.6E-09	-2.5E-09	-1.7E-09
KRISS	-4.2E-09	-5.8E-09	-3.0E-09	-5.0E-09	-5.1E-09	-5.8E-09	-5.4E-09	-3.7E-09
LNE	-8.1E-10	-8.9E-10	-8.6E-10	-9.1E-10	-9.0E-10	-8.9E-10	-8.6E-10	-1.4E-09
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	-8.3E-09	-5.8E-09	-5.2E-09	-4.6E-09	-4.7E-09	-4.6E-09	-4.9E-09	-5.1E-09
NMIJ	-2.0E-09	-1.4E-09	-3.2E-09	-2.9E-09	-3.0E-09	-2.7E-09	-3.3E-09	-3.4E-09
NMISA	-1.0E-08	-7.9E-09	-7.2E-09	-6.7E-09	-6.7E-09	-6.7E-09	-4.5E-09	-7.2E-09
NPL	-3.6E-09	-3.5E-09	-3.4E-09	-3.6E-09	-3.6E-09	-3.6E-09	-3.5E-09	-3.6E-09
NRC	-1.6E-09	-1.3E-09	-8.8E-10	-1.1E-09	-1.1E-09	-1.1E-09	-6.0E-10	-1.1E-09
PTB	-8.4E-09	-6.8E-09	-6.8E-09	-5.9E-09	-5.7E-09	-5.2E-09	-5.8E-09	-6.3E-09
VNIIOFI	-1.2E-08	-8.2E-09	-7.1E-09	-6.3E-09	-6.7E-09	-6.8E-09	-7.2E-09	-7.6E-09
MSL	-2.1E-12	-4.3E-13	-2.1E-13	-1.5E-12	-2.4E-13	-2.4E-13	-5.8E-13	-2.8E-13

Filter B

$u(\Delta_i, y_{j,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	-3.1E-08	-2.1E-09	-1.6E-09	-1.6E-09	-1.3E-09	-1.6E-09	-5.3E-10	-5.6E-10
KRISS	-4.0E-08	-2.0E-09	-1.8E-09	-1.6E-09	-1.3E-09	-6.1E-10	-1.7E-09	-2.8E-10
LNE	-1.5E-09	-2.1E-09	-1.6E-09	-1.2E-09	-1.2E-09	-1.4E-09	-9.7E-10	-1.2E-09
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	-3.6E-10	-2.1E-10	-1.5E-09	-2.7E-09	-3.4E-09	-2.8E-09	-1.8E-09	-1.4E-09
NMIJ	-5.9E-08	-2.0E-09	-2.6E-09	-1.7E-09	-2.0E-09	-2.6E-09	-1.8E-09	-9.8E-10
NMISA	-5.1E-08	-5.9E-09	-4.4E-09	-3.3E-09	-3.5E-09	-4.2E-09	-2.2E-09	-1.8E-09
NPL	-6.0E-08	-3.8E-09	-2.0E-09	-2.2E-09	-2.5E-09	-2.7E-09	-1.8E-09	-1.1E-09
NRC	-5.2E-09	-6.3E-10	-5.6E-10	-6.8E-10	-6.8E-10	-7.5E-10	-6.3E-10	-5.0E-10
PTB	-8.5E-10	-2.3E-09	-2.3E-09	-1.8E-09	-2.1E-09	-1.3E-09	-1.5E-09	-1.4E-09
VNIIOFI	-5.3E-08	-5.8E-09	-4.4E-09	-3.2E-09	-3.4E-09	-4.0E-09	-2.8E-09	-1.8E-09
MSL	-3.8E-08	-2.8E-10	-3.1E-11	-9.2E-11	-4.8E-11	-1.6E-10	-1.1E-10	-4.5E-11

The following tables contain the covariances between a measurement of a participant and the degrees of equivalence of any other participant,  $u(\Delta_i, y_{j,f,r}), i \neq j$ , for all participating laboratories.

Filter C

$u(\Delta_i, y_{j,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	-2.0E-09	-5.9E-10	-2.4E-10	-1.9E-10	-7.8E-10	-2.7E-10	-1.5E-10	-7.7E-11
KRISS	-3.3E-09	-2.3E-10	-1.5E-10	-1.5E-10	-3.3E-10	-1.3E-10	-1.2E-10	-6.8E-11
LNE	-8.8E-11	-8.3E-10	-3.1E-10	-2.2E-10	-1.1E-09	-5.1E-10	-3.0E-10	-1.5E-10
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	-9.3E-14	-1.9E-13	-3.4E-13	-3.0E-13	-2.4E-11	-1.7E-11	-2.3E-12	-1.5E-12
NMIJ	-3.6E-09	-5.0E-10	-9.9E-11	-4.8E-11	-9.0E-10	-1.4E-10	-5.3E-11	-4.8E-11
NMISA	-1.4E-09	-1.0E-09	-3.5E-10	-2.6E-10	-1.5E-09	-5.9E-10	-4.7E-11	-5.1E-11
NPL	-3.9E-09	-1.0E-09	-3.4E-10	-1.8E-10	-1.5E-09	-5.7E-10	-3.0E-10	-1.1E-10
NRC	-1.5E-09	-9.3E-10	-3.6E-10	-8.6E-11	-1.3E-09	-3.3E-10	-1.5E-10	-5.5E-11
PTB	-1.2E-11	-1.6E-10	-3.6E-11	-3.8E-11	-1.1E-10	-9.3E-11	-4.2E-11	-1.7E-10
VNIIOFI	-3.8E-09	-9.4E-10	-3.3E-10	-2.3E-10	-1.3E-09	-5.4E-10	-3.4E-10	-1.6E-10
MSL	-1.4E-09	-2.8E-10	-4.4E-11	-6.2E-11	-5.0E-10	-7.4E-11	-3.8E-11	-1.1E-11

Filter D

$u(\Delta_i, y_{j,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	-2.3E-12	-1.2E-11	-4.7E-12	-8.7E-12	-4.8E-11	-2.2E-11	-1.2E-11	-7.9E-12
KRISS	-5.8E-12	-4.3E-12	-4.0E-12	-6.6E-12	-1.3E-11	-2.8E-11	-6.0E-12	-9.3E-12
LNE	-3.9E-13	-7.5E-12	-5.7E-12	-1.1E-11	-6.6E-11	-3.2E-11	-2.4E-11	-1.8E-11
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	-3.2E-16	-2.5E-15	-4.3E-15	-4.8E-15	-1.7E-13	-4.6E-13	-5.1E-14	-2.9E-14
NMIJ	-3.3E-12	-7.5E-12	-7.5E-13	-2.6E-12	-3.1E-11	-7.2E-12	-1.4E-11	-4.2E-12
NMISA	-8.1E-14	-7.2E-12	-4.0E-12	-8.9E-12	-7.8E-11	-3.1E-11	-2.0E-13	-1.1E-12
NPL	-1.4E-12	-1.9E-11	-2.9E-12	-6.7E-12	-9.0E-11	-3.2E-11	-2.4E-11	-7.2E-12
NRC	-4.5E-07	-1.7E-06	-1.1E-06	-9.5E-07	-3.3E-06	-2.0E-06	-1.4E-06	-1.0E-06
PTB	-5.6E-15	-1.2E-12	-3.6E-12	-2.6E-12	-1.8E-11	-2.2E-11	-1.1E-11	-1.9E-11
VNIIOFI	-	-2.2E-11	-7.2E-12	-1.2E-11	-7.8E-11	-4.2E-11	-2.8E-11	-1.8E-11
MSL	-1.5E-12	-7.6E-12	-5.3E-13	-2.8E-12	-2.9E-11	-2.7E-12	-2.3E-12	-8.7E-13



The following table contains the covariances between a measurement of a participant and the degrees of equivalence of any other participant,  $u(\Delta_i, y_{j,f,r})$ ,  $i \neq j$ , for all participating laboratories.

Filter E

$u(\Delta_i, y_{j,f,r})$	Wavelength (nm)							
	380	400	500	600	700	800	900	1000
ASTAR	-1.6E-14	-1.2E-13	-1.7E-13	-2.6E-13	-3.8E-12	-5.2E-12	-3.4E-12	-2.0E-12
KRISS	-1.3E-14	-1.5E-13	-6.9E-14	-1.6E-13	-1.8E-12	-5.0E-12	-1.9E-12	-1.9E-12
LNE	-3.1E-15	-1.7E-13	-2.1E-13	-2.6E-13	-5.4E-12	-6.8E-12	-7.0E-12	-5.7E-12
MKEH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NIST	-1.0E-18	-9.3E-18	-3.8E-17	-3.6E-17	-9.9E-16	-9.0E-15	-5.4E-15	-2.7E-15
NMIJ	-7.9E-15	-3.5E-14	-6.5E-14	-6.2E-14	-1.4E-12	-2.6E-12	-3.8E-12	-8.8E-13
NMISA	-	-	-	-	-	-	-	-
NPL	-	-2.2E-14	-4.4E-14	-2.1E-13	-7.2E-12	-3.2E-12	-3.1E-12	-1.7E-12
NRC	-2.3E-16	-7.8E-15	-2.9E-14	-4.4E-14	-4.7E-12	-3.8E-12	-1.6E-12	-7.0E-13
PTB	-1.5E-17	-9.1E-15	-7.0E-14	-9.0E-14	-1.0E-12	-3.4E-12	-3.7E-12	-4.2E-12
VNIIOFI	-	-	-3.3E-13	-3.0E-13	-5.7E-12	-8.8E-12	-8.7E-12	-6.6E-12
MSL	-9.6E-16	-8.0E-14	-1.5E-14	-8.4E-14	-2.2E-12	-2.7E-13	-2.2E-13	-3.4E-13