Appendix **A.1 Description of measurement facility and measurement method**

Laboratory: Korea Research Institute of Standards and Science (KRISS)

Indicate whether this table relates to Step 2 [ √ ] or Step 4 [ ]

If the measurement setup has not changed from Step 2, check here [ ] and the following table does not need to be completed. Otherwise, please fill out the whole table.

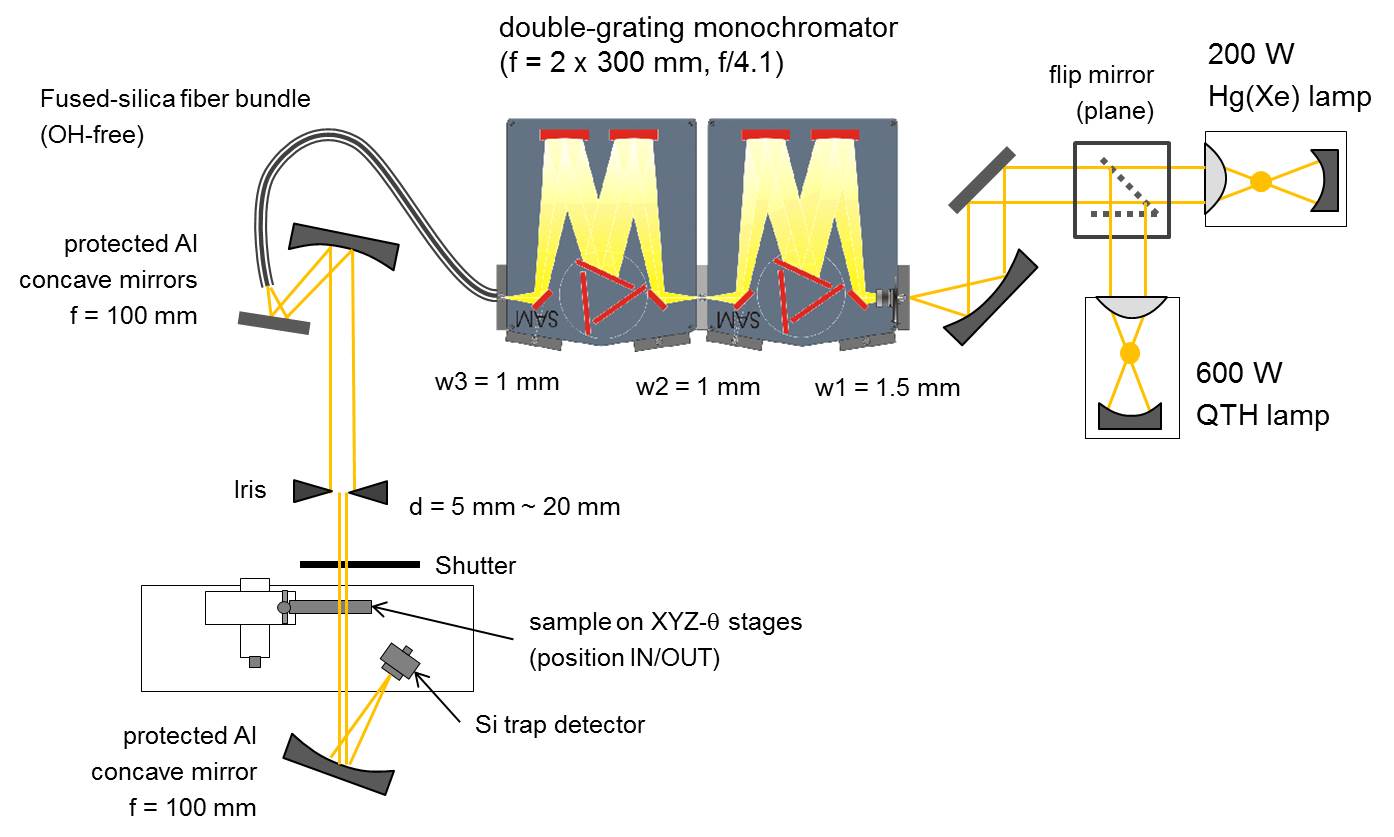
Table A-1 Details of Measurement Setup

|  |  |
| --- | --- |
| Make and Type of Spectrophotometer | KRISS design with a double monochromator in subtractive mode (Bentham DTMc300V) |
| Additional Stray Light Rejection | Order-sort filter at 400 nm, 700 nm, and 1250 nm |
| Source Drift Monitoring | Checked from two filter OUT measurements in a measurement sequence |
| Source | Quartz halogen lamp or HgXe lamp (selectable) |
| Detector | Si trap detector (3-element reflection-type) |
| Temperature(a) | ambient air measurement in the vicinity of filters by using a digital sensor,  temperature range: (22.6 ~ 27.4)°C |
| Humidity | ambient air measurement in the vicinity of filters by using a digital sensor |
| Beam Size | diameter of 17 mm  (variable between 5 mm and 20 mm) |
| Beam Collimation | collimated |
| Measurement Sequence(b) | filter IN (5 readings) - filter OUT (5 readings) - filter OUT (5 readings) - filter IN (5 readings) at each wavelength; filter orientation fixed |
| Bandwidth | 3.5 nm ~ 4.5 nm (FWHM, depending on wavelength) |

(a) i.e. describe method of temperature monitoring of filters and range of temperatures (b) i.e. describe number of measurements and whether filter orientation with respect to beam changes between measurements

Description of measuring technique (please include a diagram)

Monochromatic light from the double-monochromator is delivered to a concave mirror for collimation. The beam size is adjusted by using an iris aperture. The beam is collected by using another concave mirror into a Si trap detector. The sample is mounted on a XYZ-Theta stage in order to adjust the position and incident angle of the beam on the sample. To measure the regular transmission of the sample, the photocurrent signal of the trap detector is recorded by using an electrometer when the sample is positioned into the beam (filter IN) and out of the beam (filter OUT) at each wavelength selection. For drift monitoring, the measurement of filter-IN and filter-OUT is repeated twice in the opposite sequence so that the difference of two filter-OUT measurements corresponds to the power drift of the beam. The beam geometry and filter orientation is not changed at each measurement sequence. The temperature and humidity of the ambient air in the vicinity of the filter is recorded at each wavelength selection.



If any damage, contamination or cleaning of the filters was carried out, please give details

**Signature : Date :**

Appendix **A.2 Measurement Results**

Please reproduce the following tables for each of the five filters measured at the completion of step 2 of the comparison. All uncertainties should be reported as absolute uncertainties.

Laboratory: KRISS Filter Identifier: A

Table A-2i Measurement Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 9.1348E-01 | 9.1478E-01 | 9.1703E-01 | 9.1882E-01 | 9.1984E-01 | 9.2061E-01 | 9.2091E-01 | 9.2112E-01 |
| Number of Measurements | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Temperature | 23.1 °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C | (26.2 ±1.0) °C |
| Type A Uncertainty(b) | 7.57E-05 | 1.25E-04 | 9.93E-05 | 8.73E-05 | 6.13E-05 | 1.30E-04 | 8.49E-05 | 2.49E-05 |
| Type B Uncertainty(c) | 1.43E-03 | 1.55E-03 | 1.63E-03 | 1.35E-03 | 1.39E-03 | 1.19E-03 | 1.29E-03 | 1.28E-03 |
| Total Uncertainty(d) | 1.43E-03 | 1.56E-03 | 1.63E-03 | 1.35E-03 | 1.39E-03 | 1.20E-03 | 1.29E-03 | 1.28E-03 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| Date of Measurement Result | 12/26/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 | 9/27-10/1/2013 |

**(a)Spectral transmittance.** The value of the spectral transmittance of the central 17 mm diameter of the filter as measured by the participant laboratory. **(b)Type A Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to reproducibility of the measurement. **(c)Type B Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to all type B sources. **(d)Total Uncertainty.** The total uncertainty of the measurement of spectral transmittance for a coverage factor of k=1.

Laboratory: KRISS Filter Identifier: A

Table A-2ii Type B Uncertainty Budget(a)

Fill out the table below for the uncertainty contributions in measurement at Step 2. All uncertainties should be reported as absolute uncertainties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Nonlinearity | 9.13E-06 | 9.15E-06 | 9.17E-06 | 9.19E-06 | 9.20E-06 | 9.21E-06 | 9.21E-06 | 9.21E-06 |
| Temperature | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wavelength | 8.10E-05 | 4.58E-05 | 4.97E-06 | 3.03E-06 | 2.11E-06 | 1.96E-06 | 1.31E-06 | 1.19E-06 |
| Stray Light | 9.13E-07 | 9.15E-07 | 9.17E-07 | 9.19E-07 | 9.20E-07 | 9.21E-07 | 9.21E-07 | 9.21E-07 |
| Beam Size & Position | 3.66E-04 | 3.98E-04 | 2.91E-04 | 2.24E-04 | 1.83E-04 | 1.62E-04 | 1.01E-04 | 1.23E-04 |
| Inter-reflection | 1.10E-03 | 1.10E-03 | 1.10E-03 | 1.10E-03 | 1.10E-03 | 1.10E-03 | 1.11E-03 | 1.11E-03 |
| Obliquity | 1.79E-04 | 3.74E-04 | 5.73E-05 | 2.43E-04 | 2.96E-05 | 1.73E-04 | 3.21E-04 | 1.98E-04 |
| Polarization | 5.52E-04 | 3.46E-05 | 1.42E-05 | 1.20E-05 | 5.01E-06 | 9.76E-06 | 4.12E-06 | 3.93E-06 |
| Source Drift & Fluctuation | 6.06E-04 | 9.37E-04 | 1.16E-03 | 6.98E-04 | 8.08E-04 | 3.79E-04 | 5.63E-04 | 6.06E-04 |
| Bandwidth | 3.00E-05 | 1.40E-04 | 9.99E-06 | 3.00E-05 | 1.60E-04 | 6.01E-05 | 1.00E-05 | 9.99E-06 |
| Other(b) |  |  |  |  |  |  |  |  |
| Total Type B Uncertainty | 1.43E-03 | 1.55E-03 | 1.63E-03 | 1.35E-03 | 1.39E-03 | 1.19E-03 | 1.29E-03 | 1.28E-03 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |

(a) Please record any uncertainties considered negligible as zero (rather than e.g. < some value) (b)Add lines to the table as necessary, itemising other components of uncertainty considered

**Signature : Date :**

Laboratory: KRISS Filter Identifier: B

Table A-2i Measurement Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 4.1269E-01 | 6.0765E-01 | 6.2135E-01 | 6.0914E-01 | 6.3683E-01 | 5.7587E-01 | 5.0060E-01 | 4.5212E-01 |
| Number of Measurements | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Temperature | 23.6 °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C | (27.0 ±0.7) °C |
| Type A Uncertainty(b) | 3.05E-04 | 6.04E-05 | 8.65E-05 | 6.48E-05 | 2.70E-05 | 1.39E-05 | 5.57E-05 | 2.85E-05 |
| Type B Uncertainty(c) | 2.10E-03 | 1.15E-03 | 9.36E-04 | 8.22E-04 | 9.79E-04 | 1.17E-03 | 8.16E-04 | 7.14E-04 |
| Total Uncertainty(d) | 2.13E-03 | 1.15E-03 | 9.40E-04 | 8.24E-04 | 9.79E-04 | 1.17E-03 | 8.18E-04 | 7.15E-04 |
| Degrees of Freedom | 9.47E+03 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| Date of Measurement Result | 12/30/2013 | 10/2/2013 | 10/2/2013 | 10/2/2013 | 10/2/2013 | 10/2/2013 | 10/2/2013 | 10/2/2013 |

**(a)Spectral transmittance.** The value of the spectral transmittance of the central 17 mm diameter of the filter as measured by the participant laboratory. **(b)Type A Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to reproducibility of the measurement. **(c)Type B Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to all type B sources. **(d)Total Uncertainty.** The total uncertainty of the measurement of spectral transmittance for a coverage factor of k=1.

Laboratory: KRISS Filter Identifier: B

Table A-2ii Type B Uncertainty Budget(a)

Fill out the table below for the uncertainty contributions in measurement at Step 2. All uncertainties should be reported as absolute uncertainties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Nonlinearity | 4.13E-06 | 6.08E-06 | 6.21E-06 | 6.09E-06 | 6.37E-06 | 5.76E-06 | 5.01E-06 | 4.52E-06 |
| Temperature | 4.74E-05 | 1.28E-04 | 5.70E-05 | 1.32E-04 | 7.30E-05 | 4.49E-05 | 3.77E-05 | 5.64E-05 |
| Wavelength | 7.69E-04 | 6.47E-04 | 1.27E-05 | 7.66E-06 | 3.28E-05 | 9.59E-05 | 7.45E-05 | 3.73E-05 |
| Stray Light | 1.05E-05 | 3.25E-06 | 4.28E-06 | 3.42E-06 | 5.28E-06 | 1.05E-06 | 4.26E-06 | 7.62E-06 |
| Beam Size & Position | 2.92E-04 | 1.22E-04 | 2.56E-04 | 2.10E-04 | 9.74E-05 | 1.21E-04 | 2.71E-04 | 8.97E-05 |
| Inter-reflection | 4.95E-04 | 7.30E-04 | 7.45E-04 | 7.30E-04 | 7.64E-04 | 6.91E-04 | 6.01E-04 | 5.43E-04 |
| Obliquity | 3.62E-05 | 1.81E-04 | 1.94E-04 | 3.25E-05 | 2.46E-04 | 1.76E-04 | 2.07E-04 | 2.58E-04 |
| Polarization | 2.49E-04 | 2.30E-05 | 9.63E-06 | 7.98E-06 | 3.47E-06 | 6.10E-06 | 2.24E-06 | 1.93E-06 |
| Source Drift & Fluctuation | 5.45E-04 | 4.50E-04 | 4.62E-04 | 2.76E-04 | 5.40E-04 | 9.08E-04 | 4.27E-04 | 3.69E-04 |
| Bandwidth | 1.77E-03 | 3.20E-04 | 0 | 4.99E-05 | 7.99E-05 | 2.00E-05 | 0 | 9.99E-06 |
| Other(b) |  |  |  |  |  |  |  |  |
| Total Type B Uncertainty | 2.10E-03 | 1.15E-03 | 9.36E-04 | 8.22E-04 | 9.79E-04 | 1.17E-03 | 8.16E-04 | 7.14E-04 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |

(a) Please record any uncertainties considered negligible as zero (rather than e.g. < some value) (b)Add lines to the table as necessary, itemising other components of uncertainty considered

**Signature : Date :**

Laboratory: KRISS Filter Identifier: C

Table A-2i Measurement Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 2.2515E-02 | 9.5631E-02 | 9.1971E-02 | 7.7254E-02 | 1.6199E-01 | 1.5011E-01 | 1.0296E-01 | 7.6727E-02 |
| Number of Measurements | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Temperature | (23.2 ±0.6) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C | (24.6 ±1.2) °C |
| Type A Uncertainty(b) | 5.18E-05 | 6.27E-05 | 2.73E-05 | 2.65E-05 | 3.65E-05 | 3.84E-05 | 3.20E-05 | 1.14E-05 |
| Type B Uncertainty(c) | 4.43E-04 | 4.40E-04 | 1.71E-04 | 1.76E-04 | 3.31E-04 | 2.30E-04 | 1.72E-04 | 1.32E-04 |
| Total Uncertainty(d) | 4.46E-04 | 4.45E-04 | 1.73E-04 | 1.78E-04 | 3.33E-04 | 2.33E-04 | 1.75E-04 | 1.33E-04 |
| Degrees of Freedom | ∞ | 7.65E+03 | 6.31E+03 | 8.05E+03 | ∞ | 5.37E+03 | 3.56E+03 | ∞ |
| Date of Measurement Result | 12/29-12/30/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 | 9/26-9/27/2013 |

**(a)Spectral transmittance.** The value of the spectral transmittance of the central 17 mm diameter of the filter as measured by the participant laboratory. **(b)Type A Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to reproducibility of the measurement. **(c)Type B Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to all type B sources. **(d)Total Uncertainty.** The total uncertainty of the measurement of spectral transmittance for a coverage factor of k=1.

Laboratory: KRISS Filter Identifier: C

Table A-2ii Type B Uncertainty Budget(a)

Fill out the table below for the uncertainty contributions in measurement at Step 2. All uncertainties should be reported as absolute uncertainties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Nonlinearity | 2.25E-07 | 9.58E-07 | 9.19E-07 | 7.71E-07 | 1.62E-06 | 1.50E-06 | 1.03E-06 | 7.68E-07 |
| Temperature | 1.37E-05 | 1.35E-04 | 5.45E-05 | 1.24E-04 | 1.02E-04 | 4.25E-05 | 1.57E-05 | 3.19E-05 |
| Wavelength | 1.49E-04 | 3.46E-04 | 3.23E-05 | 6.25E-06 | 1.82E-04 | 6.07E-05 | 4.35E-05 | 1.80E-05 |
| Stray Light | 5.80E-06 | 6.35E-07 | 8.05E-07 | 1.84E-06 | 4.03E-06 | 3.26E-06 | 7.02E-08 | 1.90E-06 |
| Beam Size & Position | 1.08E-05 | 6.81E-05 | 3.77E-05 | 3.39E-05 | 3.41E-05 | 5.25E-05 | 2.64E-05 | 1.39E-05 |
| Inter-reflection | 2.70E-05 | 1.15E-04 | 1.10E-04 | 9.26E-05 | 1.94E-04 | 1.80E-04 | 1.24E-04 | 9.21E-05 |
| Obliquity | 9.78E-06 | 5.04E-05 | 4.02E-05 | 5.22E-05 | 7.31E-05 | 6.36E-05 | 5.85E-05 | 7.39E-05 |
| Polarization | 1.36E-05 | 3.62E-06 | 1.43E-06 | 1.01E-06 | 8.82E-07 | 1.59E-06 | 4.61E-07 | 3.28E-07 |
| Source Drift & Fluctuation | 3.35E-05 | 7.99E-05 | 9.74E-05 | 5.57E-05 | 1.47E-04 | 8.97E-05 | 9.01E-05 | 4.35E-05 |
| Bandwidth | 4.14E-04 | 1.72E-04 | 1.99E-05 | 9.95E-06 | 2.01E-05 | 9.97E-06 | 0 | 1.00E-05 |
| Other(b) |  |  |  |  |  |  |  |  |
| Total Type B Uncertainty | 4.43E-04 | 4.40E-04 | 1.71E-04 | 1.76E-04 | 3.31E-04 | 2.30E-04 | 1.72E-04 | 1.32E-04 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |

(a) Please record any uncertainties considered negligible as zero (rather than e.g. < some value) (b)Add lines to the table as necessary, itemising other components of uncertainty considered

**Signature : Date :**

Laboratory: KRISS Filter Identifier: D

Table A-2i Measurement Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 3.8876E-04 | 5.1905E-03 | 8.3944E-03 | 8.3322E-03 | 2.6594E-02 | 3.2160E-02 | 2.2484E-02 | 1.6656E-02 |
| Number of Measurements | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Temperature | (23.3 ±0.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C | (24.3 ±1.1) °C |
| Type A Uncertainty(b) | 2.40E-07 | 5.71E-06 | 2.17E-06 | 4.08E-06 | 1.70E-06 | 6.19E-06 | 1.95E-06 | 3.76E-06 |
| Type B Uncertainty(c) | 2.23E-05 | 4.16E-05 | 1.83E-05 | 2.89E-05 | 6.45E-05 | 5.12E-05 | 3.30E-05 | 3.02E-05 |
| Total Uncertainty(d) | 2.23E-05 | 4.20E-05 | 1.84E-05 | 2.92E-05 | 6.45E-05 | 5.15E-05 | 3.30E-05 | 3.05E-05 |
| Degrees of Freedom | ∞ | 9.25E+03 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| Date of Measurement Result | 12/29/2013 | 10/4/2013 | 10/4/2013 | 10/4/2013 | 10/4/2013 | 10/4/2013 | 10/4/2013 | 10/4/2013 |

**(a)Spectral transmittance.** The value of the spectral transmittance of the central 17 mm diameter of the filter as measured by the participant laboratory. **(b)Type A Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to reproducibility of the measurement. **(c)Type B Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to all type B sources. **(d)Total Uncertainty.** The total uncertainty of the measurement of spectral transmittance for a coverage factor of k=1.

Laboratory: KRISS Filter Identifier: D

Table A-2ii Type B Uncertainty Budget(a)

Fill out the table below for the uncertainty contributions in measurement at Step 2. All uncertainties should be reported as absolute uncertainties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Nonlinearity | 3.89E-09 | 5.20E-08 | 8.39E-08 | 8.31E-08 | 2.66E-07 | 3.21E-07 | 2.25E-07 | 1.67E-07 |
| Temperature | 4.26E-07 | 1.58E-05 | 9.58E-06 | 2.41E-05 | 3.24E-05 | 1.57E-05 | 5.00E-06 | 1.05E-05 |
| Wavelength | 3.28E-06 | 2.66E-05 | 2.16E-06 | 3.75E-06 | 4.08E-05 | 8.73E-06 | 1.02E-05 | 3.20E-06 |
| Stray Light | 1.19E-06 | 8.42E-07 | 5.86E-07 | 5.88E-07 | 6.78E-07 | 1.08E-06 | 3.96E-07 | 1.39E-08 |
| Beam Size & Position | 3.28E-07 | 5.80E-06 | 1.47E-06 | 2.65E-06 | 1.64E-06 | 3.70E-06 | 3.38E-06 | 5.76E-06 |
| Inter-reflection | 4.67E-07 | 6.24E-06 | 1.01E-05 | 9.97E-06 | 3.19E-05 | 3.86E-05 | 2.70E-05 | 2.00E-05 |
| Obliquity | 4.09E-07 | 1.74E-05 | 2.37E-07 | 1.98E-06 | 1.54E-05 | 2.04E-05 | 6.12E-06 | 1.01E-05 |
| Polarization | 2.35E-07 | 1.97E-07 | 1.30E-07 | 1.09E-07 | 1.45E-07 | 3.41E-07 | 1.01E-07 | 7.12E-08 |
| Source Drift & Fluctuation | 1.08E-06 | 1.99E-05 | 5.90E-06 | 5.27E-06 | 1.37E-05 | 1.94E-05 | 1.34E-05 | 1.26E-05 |
| Bandwidth | 2.20E-05 | 0 | 9.97E-06 | 9.94E-06 | 0 | 0 | 0 | 1.00E-05 |
| Other(b) |  |  |  |  |  |  |  |  |
| Total Type B Uncertainty | 2.23E-05 | 4.16E-05 | 1.83E-05 | 2.89E-05 | 6.45E-05 | 5.12E-05 | 3.30E-05 | 3.02E-05 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |

(a) Please record any uncertainties considered negligible as zero (rather than e.g. < some value) (b)Add lines to the table as necessary, itemising other components of uncertainty considered

**Signature : Date :**

Laboratory: KRISS Filter Identifier: E

Table A-2i Measurement Results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Spectral Transmittance(a) | 1.2911E-05 | 3.2052E-04 | 8.8426E-04 | 9.5151E-04 | 4.8799E-03 | 9.3408E-03 | 8.1256E-03 | 6.8614E-03 |
| Number of Measurements | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Temperature | 23.5 °C | 23.5 °C | (24.4 ±0.8) °C | (24.4 ±0.8) °C | (24.4 ±0.8) °C | (24.4 ±0.8) °C | (24.4 ±0.8) °C | (24.4 ±0.8) °C |
| Type A Uncertainty(b) | 1.21E-07 | 3.05E-07 | 5.20E-07 | 8.76E-07 | 6.32E-07 | 2.00E-06 | 1.64E-06 | 2.08E-06 |
| Type B Uncertainty(c) | 1.07E-06 | 9.18E-06 | 2.90E-06 | 4.28E-06 | 1.47E-05 | 1.54E-05 | 1.32E-05 | 1.26E-05 |
| Total Uncertainty(d) | 1.07E-06 | 9.18E-06 | 2.94E-06 | 4.37E-06 | 1.47E-05 | 1.55E-05 | 1.33E-05 | 1.28E-05 |
| Degrees of Freedom | ∞ | ∞ | 3.97E+03 | 2.45E+03 | 8.01E+03 | ∞ | ∞ | 5.07E+03 |
| Date of Measurement Result | 12/30/2013 | 12/30/2013 | 12/3/2013 | 12/3/2013 | 12/3/2013 | 12/3/2013 | 12/3/2013 | 12/3/2013 |

**(a)Spectral transmittance.** The value of the spectral transmittance of the central 17 mm diameter of the filter as measured by the participant laboratory. **(b)Type A Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to reproducibility of the measurement. **(c)Type B Uncertainty.** The uncertainties associated with the spectral transmittance values attributed to all type B sources. **(d)Total Uncertainty.** The total uncertainty of the measurement of spectral transmittance for a coverage factor of k=1.

Laboratory: KRISS Filter Identifier: E

Table A-2ii Type B Uncertainty Budget(a)

Fill out the table below for the uncertainty contributions in measurement at Step 2. All uncertainties should be reported as absolute uncertainties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wavelength  (nm) | 380 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Nonlinearity | 1.29E-10 | 3.21E-09 | 8.83E-09 | 9.48E-09 | 4.87E-08 | 9.33E-08 | 8.12E-08 | 6.87E-08 |
| Temperature | 2.05E-08 | 1.01E-06 | 1.30E-06 | 3.49E-06 | 7.66E-06 | 5.55E-06 | 2.26E-06 | 7.18E-06 |
| Wavelength | 1.12E-07 | 5.14E-06 | 2.89E-07 | 7.54E-07 | 1.03E-05 | 1.06E-06 | 2.35E-06 | 2.81E-07 |
| Stray Light | 4.83E-07 | 3.05E-07 | 2.59E-07 | 2.44E-07 | 2.68E-08 | 3.41E-07 | 2.57E-07 | 1.68E-07 |
| Beam Size & Position | 1.25E-07 | 7.23E-06 | 7.19E-07 | 8.65E-07 | 2.89E-06 | 2.67E-06 | 4.86E-06 | 4.58E-06 |
| Inter-reflection | 1.55E-08 | 3.85E-07 | 1.06E-06 | 1.14E-06 | 5.85E-06 | 1.12E-05 | 9.75E-06 | 8.24E-06 |
| Obliquity | 1.26E-07 | 1.80E-06 | 5.50E-07 | 2.26E-07 | 1.11E-06 | 2.47E-06 | 2.01E-06 | 1.96E-06 |
| Polarization | 7.80E-09 | 1.21E-08 | 1.37E-08 | 1.24E-08 | 2.65E-08 | 9.89E-08 | 3.64E-08 | 2.93E-08 |
| Source Drift & Fluctuation | 4.62E-07 | 8.89E-07 | 1.94E-06 | 1.84E-06 | 3.08E-06 | 8.14E-06 | 6.43E-06 | 3.74E-06 |
| Bandwidth | 8.05E-07 | 5.37E-07 | 9.30E-07 | 7.10E-08 | 0 | 0 | 0 | 0 |
| Other(b) |  |  |  |  |  |  |  |  |
| Total Type B Uncertainty | 1.07E-06 | 9.18E-06 | 2.90E-06 | 4.28E-06 | 1.47E-05 | 1.54E-05 | 1.32E-05 | 1.26E-05 |
| Degrees of Freedom | ∞ | ∞ | ∞ | ∞ | 8.04E+03 | ∞ | ∞ | ∞ |

(a) Please record any uncertainties considered negligible as zero (rather than e.g. < some value) (b)Add lines to the table as necessary, itemising other components of uncertainty considered

**Signature : Date :**