Final Report of the APMP Comparison of Luminous Responsivity (APMP.PR-K3.b)

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Introduction

Luminous responsivity is a Key Comparison quantity for the Consultative Committee on Photometry and Radiometry (CCPR) of the International Bureau of Weights and Measures (BIPM), linked to the SI unit for luminous intensity, the candela. The CCPR completed a comparison of luminous responsivity in 1998, subsequently designated CCPR-K3.b. This document reports the method and results of an international intercomparison of luminous responsivity within the Asia Pacific Metrology Program (APMP), following the protocols as laid down for the Mutual Recognition Arrangement of the General Conference of Weights and Measures (CIPM). In Appendix B the results of the CCPR and the APMP comparisons are linked together.

	Institute	Country
Coordinator: CSIRO	CSIRO National Measurement Laboratory	Australia
Participants: ITRI KIM-LIPI KRISS MSL NPLI PSB ¹ SIRIM	CMS/ITRI KIM-LIPI Korean Research Institute of Standards & Science Measurement Standards Laboratory National Physical Laboratory Productivity and Standards Board SIRIM National Metrology Centre	Chinese Taipe Indonesia Korea New Zealand India Singapore Malaysia

SIRIM received the photometers, but did not present results, citing staffing problems.

Comparison photometers

Two photometers were circulated. These were two of those used in the CCPR luminous responsivity comparison by CSIRO, the coordinating laboratory for this comparison. The third had shown problems with changes in transmittance of the cemented window or filter, with interference fringes appearing in the aperture . Both were temperature stabilised and with V λ filters uniform over the full aperture. The first was a LMT type P15FOT Serial Number 39638, with a nominal aperture diameter of 15 mm and approximate response 50 nA/lx. The second was an Inphora Serial Number 0696PO112 with a nominal aperture of 9 mm and approximate response 16 nA/lx.

¹ Now re-named as SPRING Singapore - Standards, Productivity and Innovation Board

Spectral characterisation, linearity measurements, effect of apertures close to the photometers, sensitivity to alignment and thermal loading of the mount were all determined for these photometer types as part of the CCPR comparison by BIPM. Details can be found in the report of that comparison [1]. Spectral characterisation of the photometers had been undertaken on the photometers at CSIRO; the participant laboratories were not required to make these measurements.

Spectral matching to V(λ) was such that the Inphora photometer response varied by < 0.01% for lamps whose distribution temperature varied from 2000-3000 K. The LMT photometer showed a variation of order 0.2% for the same range. The different variation for these photometers was thought to be useful as a secondary check on setting of distribution temperature – not all of the APMP participant laboratories have the capability of measuring this directly.

The LMT photometer was irreparably damaged by incorrect connections at one of the participant laboratories. The silicon photodiode and filter package in this device are cemented together. CSIRO had to hand a window-less silicon photodiode of the correct dimensions, and the facilities to cut and re-cement this to the filter. The detector type did not match that of the original device and so the spectral responsivity of the repaired detector (renamed 39638A to distinguish it from the original) was altered. Figure 1 shows the spectral responsivity of both modes. The f_1 ' value of the photometer was changed from 2.3% to 13%. The sensitivity of the detector to variations in distribution temperature was also changed, now being 0.7% over the range 2000-3000 K.



Figure 1. Change in relative spectral responsivity for the LMT photometer with the replaced silicon photodetector

Protocol for the comparison

The comparison was carried out in a star fashion, with CSIRO making measurements before and after each of the participating laboratories. While extending the overall time for a comparison, such a procedure offers the best checking for drift and protection against loss in a region where transportation of goods between countries is not always reliable. Participants were advised that the responses of the photometers to a field of illuminance, with a distribution of CIE illuminant A, approximately in the range 10-50 lx, were required, to be reported in units of nA/lx. Mounting details were provided in advance, so that the laboratory could minimise the time for required for measurement by preparing before receiving the photometers. Details of power supplies required were also provided in advance.

Participants were asked to identify the following uncertainty components:

- Required uncertainty components:
- Uncertainty of the base unit
- Uncertainty of the transfer measurement
- Uncertainty due to position of detector
- Other relevant components

In all cases, uncertainty of the base unit was the dominant component.

An approximate schedule was arranged in consultation with the laboratories, but delays in customs and damage to one of the photometers meant that the schedule was delayed, and laboratories were contacted prior to shipping from CSIRO to confirm that they were in a position to receive and measure the photometers in a timely manner.

CSIRO results

Special mounting jigs for the photometers were used at CSIRO to minimise effects of repositioning. The photometers were mounted with their measurement planes at a fixed distance from a lamp operated as an illuminance standard, calibrated against the CSIRO primary photometer. Tables 1 and 2 show repeat measurements of the photometers at CSIRO between the participant measurements, with the results plotted in Figures 2-4. The results also show the effect of cleaning. The photometer was always measured at CSIRO as received, but in a number of cases required cleaning of the windows to remove dust or marks. The window was subjected to warm, moist air and wiped with a fresh soft tissue. After a period of some hours the response was then remeasured before sending the photometers to the next participant. All measurements are shown in the table.

Index	Date	Notes	Sensitivity	Standard
			(nA/lx)	Uncertainty
				(nA/lx)
1	October 13, 1998		16.447	0.037
2	December 9, 1998		16.404	0.028
3	March 17, 1999		16.442	0.028
4	March 18, 1999	Cleaned at NML	16.438	0.028
5	May 6, 1999		16.439	0.028
6	June 18, 1999		16.447	0.028
7	June 18 - 22, 1999	Blew dust from	16.441	0.028
		window		
8	August 26,1999		16.474	0.028
9	August 30, 1999	Repeat	16.467	0.028
10	January 17, 2000		16.469	0.028
11	January 19, 2000	Cleaned at NML	16.468	0.028
12	May 18, 2000		16.425	0.028
13	July 25, 2000		16.438	0.028

 Table 1. CSIRO repeat measurements of the Inphora responsivity.

Index	Date		Sensitivity	Standard
			(nA/lx)	Uncertainty
			· ·	(nA/lx)
1	October 13, 1998		50.161	0.097
2	December 9, 1998		50.055	0.085
3	March 17, 1999		50.183	0.086
4	March 18, 1999	Cleaned	50.126	0.085
5	May 6, 1999		50.080	0.085
6	June 18, 1999		50.054	0.085
7	June 18 - 22, 1999	Dust removed	50.080	0.085
		Photodiode replaced		
8	August 30, 1999		38.595	0.066
9	January 17, 2000		38.601	0.066
10	January 19, 2000	Repeat	38.597	0.066
11	May 18, 2000		38.594	0.067
12	July 25, 2000		38.582	0.066









Laboratory results

The results reported by the laboratories are shown in Table 3. The uncertainties indicated are those of the laboratory only. The uncertainty of the laboratory primary standard is also shown. In most cases, this base uncertainty dominates the uncertainty as the transfer to the comparison artefact adds only a small amount. The PSB result for the LMT-A photometer has been corrected for a source of distribution temperature 2856K. The responsivity measured at PSB for a 2800 K source was 38.494 nA/lx. The MSL stated its standard uncertainty as 0.18 % with two degrees of freedom. This was multiplied with a coverage factor of 1.32 (for 2 d.o.f. , 68.3 %) to obtain the uncertainty for 68.3 % confidence, which is 0.24 %.

Appendix A contains a brief summary of the derivation of each laboratory's photometric standards.

Table 3. Measurements reported by the participants. Relative standard uncertainties (%) shown here are for the participant laboratory only. Laboratories marked * measured the LMT detector after replacement of the photodiode.

Laboratory.	LMT	LMT-A	Inphora	Base
	nA/lx	nA/lx	nA/lx	uncertainty
KIM-LIPI *	-	$50.47 \pm 0.33\%$	$21.89\pm0.33\%$	0.30%
KRISS	$49.47\pm0.27\%$	-	$16.22 \pm 0.27\%$	0.25%
PSB *	-	$38.41 \pm 0.54\%$	$16.42 \pm 0.54\%$	
ITRI	$50.60\pm0.7\%$	-	$16.67\pm0.7\%$	0.7%
MSL	$50.20\pm0.24\%$	-	$16.44 \pm 0.24\%$	0.24%
NPLI *	-	$39.10 \pm 1.30\%$	$16.70 \pm 1.32\%$	1.2%
CSIRO	-		-	0.17%

Ratios to CSIRO

No significant difference was found between each participant's measurements on the Inphora and LMT photometers. The mean ratio and standard uncertainty for each laboratory relative to the CSIRO results is shown in Table 4. The measurements on the Inphora and LMT photometers made by each laboratory are correlated through the laboratory base standards. Standard uncertainties (relative) in the mean ratio are calculated as follows:

The transfer uncertainty of each measurement is obtained by quadrature subtraction of the base uncertainty from the reported standard uncertainty. For each photometer, the uncorrelated transfer uncertainties of the before and after CSIRO results are averaged in quadrature and the uncertainty in the ratio [laboratory:CSIRO] formed by quadrature addition. The two detector ratios are then averaged, with the propagated uncertainty in this average representing the transfer uncertainty between the laboratory and CSIRO. The final uncertainty is then found by adding in quadrature this transfer uncertainty with the base uncertainties of the laboratory and CSIRO.

Laboratory	Ratio to CSIRO	Standard uncertainty
ITRI	1.0123	0.0072
MSL	1.0013	0.0029
KRISS	0.9868	0.0031
NPLI	1.0135	0.0127
KIM-LIPI	1.3192	0.0036
PSB	0.9973	0.0055

Table 4. Mean ratios and standard uncertainties between the participants and CSIRO.

Linking to the CCPR Key Comparison

Two CCPR Key Comparisons are relevant to the APMP comparison. These are the direct equivalent, that of luminous responsivity CCPR-K3.b, and luminous intensity CCPR-K3.a. Both trace to the determination of the candela. Three of the participating laboratories – CSIRO, KRISS and MSL – are members of CCPR. Only CSIRO participated in the CCPR luminous intensity comparison. All three participated in the CCPR luminous responsivity comparison, but KRISS identified a problem with their reference photometer and the values obtained were not reliable. Values for CSIRO and MSL relative to the key comparison reference values are shown in Table 5. The uncertainties are the combined standard uncertainties of the deviations from the reference value. Subsequent to the CCPR and prior to this comparison, MSL re-established their primary reference, finding a relative change in value of +0.0096 with a standard uncertainty of 0.0004. The effect of this change is shown in Table 5.

Table 5. Performance of link laboratories in CCPR key comparisons shown as (laboratory	-
reference value) and its standard uncertainty.	

Laboratory	Luminous responsivity	Luminous intensity
CSIRO	0.0009 ± 0.0019	-0.0007 ± 0.0030
MSL	-0.0081 ± 0.0026	
MSL amended	0.0015 ± 0.0026	

The two CSIRO results in the two CCPR comparisons are correlated through the common base standard with its uncertainty 0.0017. Averaging the two results and taking the partial correlation into account leads to a factor of (1.0001 ± 0.0022) by which the ratios of Table 4 must be multiplied to obtain the degrees of equivalence when using only the CSIRO as the link laboratory.

If the link is made by using the MSL, the corresponding factor is $1.0015/1.0013 \pm 0.0026$, that is (1.0002 \pm 0.0026). The division by 1.0013 takes into account that the data in Table 4 are referenced to CSIRO. To apply the correction factor of 1.0015 obtained with the MSL results from Table 5, the data of Table 4 have to be normalised to the MSL result, that means to be divided by 1.0013.

Taking the average of both link factors and treating their uncertainties as uncorrelated² gives (1.0002 ± 0.0017) , factor by which the ratios of Table 4 must be multiplied to obtain the degrees of equivalence based on the two link laboratories. These are shown in Table 6. Results for MSL are not included in this table as their equivalence was used in the derivation of the values shown.

responsivity, relative to the CCPR Key Comparison reference value.				
Laboratory	Ratio to CCPR	Standard		

Table 6. Degrees of equivalence of APMP laboratories for measurements of luminous

Laboratory	Ratio to CCPR	Standard		
	reference value	uncertainty		
ITRI	1.013	0.007		
KRISS	0.987	0.004		
NPLI	1.014	0.013		
KIM-LIPI	1.320	0.004		
PSB	0.997	0.006		

 $^{^{2}}$ A small correlation exists due to the use of the same reference value of CCPR-K3.b used to calculate the CSIRO and MSL results in Table 5. Since the uncertainty of the reference value is very small (0.0006), the same is true for the correlation, which can therefore be neglected.

Reference

[1] Final Report on the International Comparison of Luminous Responsivity CCPR-K3.b, *Metrologia Techn. Suppl. xxx*

Appendix A - Participant's realisations of the candela.

The information provided for the derivation of the participant's primary standards is as follows:

KIM-LIPI	 Wi 41/G luminous intensity standards calibrated by PTB. Last calibrated 1992.
PSB	- luminous intensity standards traceable to BIPM. Last calibrated 1998.
KRISS	- reference photometer traceable to the KRISS cryogenic radiometer.
CMS/ITRI	– independent realisation of illuminance using an electrically-calibrated radiometer and photopic filters.
MSL	 independent realisation of luminous responsivity in 1998, based on silicon- trap photometers referenced to a cryogenic radiometer.
NPLI	- Wi 41/G luminous intensity standards calibrated by BIPM at 2 yearly intervals.
CSIRO	- independent realisation of illuminance using commercial photometers calibrated against silicon trap responsivity standards referenced to a cryogenic radiometer.

Appendix B - Link with CCPR-K3.b

Calculation of degrees of equivalence for APMP.PR-K3.b

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The degrees of equivalence for the participants of APMP.PR-K3.b are shown in Table 6 of this comparison report. The results for those of them which are signatories of the MRA but not link laboratories are shown in Table B.1 below. For the link laboratories, CSIRO and MSL, no new degrees of equivalence are generated from their participation in the APMP comparison. Their role as link laboratory assumes that their standards did not change. Nevertheless, a new entry will be created in the database for the MSL showing their results of the CCPR comparison recalculated to their amended primary reference. Although KRISS participated in the CCPR comparison, a new entry is generated, because it was not used as a link laboratory since it identified a problem with its reference photometer after the CCPR comparison.

	Degrees of equivalence				
Laboratory	Relative deviation from KCRV of CCPR-K3.b	Standard uncertainty of deviation			
ITRI	0.013	0.007			
KRISS	-0.013	0.004			
NPLI	0.014	0.013			
PSB	-0.003	0.006			

 Table B.1:
 Degrees of equivalence for the participants of APMP.PR-K3.b which are signatories of the MRA but not link laboratories.

The mutual degrees of equivalence between participants of the APMP comparison only are calculated directly from their results in the APMP comparison (Table B.2). The deviations between two participants are calculated as the difference of their deviations from the pilot laboratory (CSIRO). These deviations do not depend on the results of CSIRO. The uncertainties of the bilateral differences are calculated as the square root of the quadratic sum of the uncertainties of the deviations from the pilot laboratory, taken from Table 4 of the Final Report. The contribution of a possible systematic³ uncertainty of the CSIRO measurements during the APMP comparison should be removed from the uncertainty of the bilateral deviations. This contribution is at the moment unknown, but certainly smaller than 0.0017, which is the CSIRO uncertainty related to their standards.

	$D_{ii} = x_i - x_j$	$D_{ii} = x_i - x_i$ ITRI		KRISS		NPLI		PSB	
1		D_{ij}	u _{ij}	D _{ij}	u _{ij}	D _{ij}	u _{ij}	D _{ij}	u _{ij}
	ITRI			0.026	0.008	-0.001	0.015	0.015	0.009
	KRISS	-0.026	0.008			-0.027	0.013	-0.011	0.006
	NPLI	0.001	0.015	0.027	0.013			0.016	0.014
♦	PSB	-0.015	0.009	0.011	0.006	-0.016	0.014		

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Table B.2: Bilateral deviations D_{ij} between pairs of participants of the APMP comparison and related uncertainties u_{ij} .

³ A systematic uncertainty is understood as an uncertainty related to an effect leading to a systematic bias or error in the measurements.

The degrees of equivalence between one of the laboratories KRISS, NPLI, PSB and ITRI and one of the link laboratories CSIRO and MSL is also determined directly from the APMP comparison. The degree of equivalence between CSIRO and MSL remains the one already found in the CCPR comparison, but is re-calculated to the new MSL reference.

	CSIRO		MSL, amended		MSL, old	
	D_{ij}	u _{ij}	D_{ij}	u _{ij}	D_{ij}	u _{ij}
ITRI	0.012	0.007	0.011	0.008	0.021	0.008
KRISS	-0.013	0.003	-0.015	0.004	-0.005	0.004
NPLI	0.014	0.013	0.012	0.013	0.022	0.013
PSB	-0.003	0.006	-0.004	0.006	0.006	0.006

Table B.3: Degrees of equivalence between the participants of the APMP comparison only and the link laboratories.

The deviations between a CCPR participant (i) and an APMP participant (j), who did not participate in the CCPR comparison, are calculated via the KCRV:

 $D_{ij} = D_{i,CCPR} - D_{j,APMP} = (x_{i,CCPR} - KCRV) - (x_{j,APMP} - KCRV)$

i

The $D_{i,CCPR}$ are taken from Table 4 of the Final Report of the CCPR comparison [1]. The $D_{i,APMP}$ are taken from Table B.1.

The corresponding uncertainty is calculated as the square root of the quadratic sum of the individual uncertainties. A correlation exist from the use of the key comparison reference value in both comparisons, but this is negligible in comparison to the relatively large uncertainties of the APMP participants. The KRISS result of the CCPR comparison is not linked to the results of the APMP comparison because it is considered as erroneous. Only the KRISS result of the APMP round is used for this purpose.

Participants of	Participants of APMP comparison							
CCPR comparison	ITRI		KRISS		NPLI		PSB	
	D_{ij}	u _{ij}	D_{ij}	u _{ij}	D_{ij}	u _{ij}	Dij	u _{ij}
BNM-INM	-0.021	0.008	0.005	0.005	-0.022	0.013	-0.005	0.007
CSIC	-0.009	0.008	0.017	0.005	-0.010	0.013	0.007	0.007
CSIRO	-0.012	0.007	0.013	0.003	-0.014	0.013	0.003	0.006
HUT	-0.017	0.008	0.010	0.005	-0.018	0.013	-0.001	0.007
KRISS	-0.026	0.008			-0.027	0.013	-0.011	0.006
MSL (amended)	-0.011	0.008	0.015	0.004	-0.012	0.013	0.004	0.006
NIM	-0.012	0.007	0.014	0.004	-0.013	0.013	0.004	0.006
NIST	-0.015	0.007	0.012	0.004	-0.016	0.013	0.002	0.006
NPL	-0.013	0.007	0.013	0.004	-0.014	0.013	0.003	0.006
NRC	-0.013	0.009	0.013	0.006	-0.014	0.014	0.003	0.008
OFMET	-0.003	0.007	0.023	0.005	-0.004	0.013	0.013	0.007
ОМН	-0.017	0.008	0.009	0.005	-0.018	0.013	-0.001	0.007
РТВ	-0.010	0.007	0.017	0.004	-0.011	0.013	0.007	0.006
SMU	-0.015	0.010	0.011	0.009	-0.016	0.015	0.001	0.010
VNIIOFI	-0.010	0.007	0.016	0.005	-0.011	0.013	0.006	0.006
BIPM	-0.015	0.007	0.011	0.005	-0.016	0.013	0.001	0.007

→ j

Table B.4: Degrees of equivalence between the participants of the APMP comparison and those of the CCPR comparison. Results in *italics* are directly calculated from the results of APMP.PR-K3.b.

The degrees of equivalence for the CCPR and APMP participants are shown in the following graph. The bilateral degrees of equivalence are shown in the table.



Link between CCPR and APMP comparison K3.b

Key comparison CCF	R-K3.b and APMP.PR-K	3.b						
CCPP K3 h								
MEASURAND:	Luminous responsivity of pho	tometers						
The individual measurem	ents, x _i , of the participating l	aboratories correspond to the re	sults of a virtual calibration of the					
luminous responsivity of t	the same photometer.							
Key comparison referenc	e value: the KCRV is calculate	ed as the weighted mean of the p	participants results, weighted by the	and the extended an address (CDV)				
inverse square of the unc	ertainties with the application	i of a minimum uncertainty cutor	n of 0.2 %. The KRISS is excluded fro	om the calculation of the KCRV				
The degree of equivalence	ce of each laboratory with res	pect to the reference value is giv	ven by a pair of numbers:					
$D_i = (x_i \cdot x_{KCRV})$ and U_i , i	ts expanded uncertainty (k =	2), both expressed in relative un	nits					
$U_i^2 = 2^2 (u_i^2 + u_{\rm KCRV}^2 - u_{\rm CRV}^2)$	corr + u ² transfer), where u _{corr} is	the correlation between u_i and	UKCRV					
The degree of equivalent	e hetween two laboratories is	s given by a nair of numbers:						
$D_{ii} = D_i \cdot D_i = (\mathbf{x}_i \cdot \mathbf{x}_{KCRV})$	$-(x_i - x_{KCRV})$ and U_{ii} its exp	anded uncertainty (k = 2), both e	expressed in relative units					
$U_{ij}^{2} = 2^{2} (u_{i}^{2} + u_{j}^{2} + 2u_{tran})$	sfer ²)							
APMP-PR-KJ.D								
If more than one possibili	ity exists to calculate the degr	ree of equivalence between two	laboratories, the most direct way is	chosen.				
Faadha Awa Kululahaadaa	CCIDO and MCI) as a series		10					
For the KRISS a new resu	it is produced by the APMP c	omparison, because it did not pa	articipate as a link laboratory due to	its measurement problems in the CCPR comp	parison			
A new entry is generated	for MSL showing the results o	of the CCPR comparison recalcul	lated to their amended reference wh	nich was used for the APMP comparison.				
Between the participants	of the APMP comparison only	y, the degrees of equivalence are	e calculated directly from the results	s of the APMP comparison.				
Between the participants	of the APMP comparison only	y, and one of the two link laborat	tories (CSIRO and MSL) the degrees	of equivalence are taken directly from the AP	PMP comparison.			
between the participants	of the APMP comparison only	, and mose of the CCPR compar	ison (except CSIRO and MSL), the di	regrees of equivalence are carculated via the	RCRV.			
CCPR-K3.b	Lab j 👄							
CCPR-K3.b	Lab j \Longrightarrow	CSIRO HUT I	RL (KRISS) *NIM	NIST I*NPL I NRC I OF	FMER OMH *PTB SMU VI	NIIOFI BIPM MSL/IRL		NPLI PSB
CCPR-K3.b	Lab $j \longrightarrow$ BNM-INM CSIC γ $D_{ij} U_{ij} D_{ij} U_{ij}$	CSIRO HUT I D _{ij} U _{ij} D _{ij} U _{ij} D _{ij}	RL (KRISS) [*] NIM U _{ij} D _{ij} U _{ij} D _{ij} U _{ij}	NIST *NPL NRC OF D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} D _{ij}	FMET OMH "PTB SMU VU U ₁ D ₁ U ₁ D ₁ U ₂ D ₁ U ₃ D ₁	NIIOFI BIPM MSL/IRL U _{ij} D _{ij} U _{ij} D _{ij} U _{ij}	ITRI KRISS Dij Uij Dij Uij	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij}
CCPR-K3.b	Lab j \longrightarrow BNM-INM CSIC \uparrow D_{ij} U_{ij} D_{ij} U_{ij} $/10^2$ $/10^2$ $/10^2$ $/10^2$	CSIRO HUT I D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} /10 ² /10 ² /10 ² /10 ²	IRL (KRISS) *NIM U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} / 10 ²	NIST *NPL NRC OF D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} /10 ² /10 ² /10 ² /10 ² /10 ² /10 ²	FMET /0MH *PTB SMU VI U _i D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} 2 /10 ²	NIIOFI BIPM MSL/IRL U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} 2 / 10 ²	ITRI KRISS D _{ij} U _{ij} D _{ij} U _{ij} / 10 ² / 10 ² / 10 ² / 10 ²	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij} / 10 ⁻² / 10 ⁻² / 10 ⁻² / 10 ⁻²
CCPR-K3.b	Lab j BNM-INM CSIC N D _{ij} U _{ij} D _{ij} U _{ij} / 10 ² / 10 ² / 10 ² 1.18 0.86	CSIRO HUT I Dij Uij Dij Uij Dij / 10 ² 0.89 0.71 0.45 0.86 0.01 0.29 0.74 0.73 0.88 1.99	U_{ij} O_{ij} U_{ij} O_{ij} U_{ij} J_{02} J_{10}^2 <td< th=""><th>NIST *NPL NRC OF D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} /10² /10² /10² /10² /10² /10² /10² 0,65 0,73 0,77 0,71 0,88 117 18.84 0,51 0,78 0,44 0,74 0,38 119 8.64</th><th>FMET OMH *PTB SMU VI U_{ij} D_{ij} D_{ij}</th><th>NIIOFI BIPM MSL/IRL U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} 2 /10² /10² /10² /10² /10² 0 0.78 0.64 0.79 0.95 0.83 0.81 0.23 0.8</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} /10² /10² /10² /10² 2,2 2,7 0,5 1.3 10 2,7 0,7 1.3</th></td<>	NIST *NPL NRC OF D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} /10 ² 0,65 0,73 0,77 0,71 0,88 117 18.84 0,51 0,78 0,44 0,74 0,38 119 8.64	FMET OMH *PTB SMU VI U_{ij} D_{ij}	NIIOFI BIPM MSL/IRL U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} 2 /10 ² /10 ² /10 ² /10 ² /10 ² 0 0.78 0.64 0.79 0.95 0.83 0.81 0.23 0.8	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij} /10 ² /10 ² /10 ² /10 ² 2,2 2,7 0,5 1.3 10 2,7 0,7 1.3
CCPR-K3.b Lab i Di Ui / 10 ² / 10 ² BNM-INM -0,00 0.57 CSIC 0.38 0,61 *CSIRO 0.09 0.39	Lah j BNM-INM CSIC D _{ij} U _{ij} D _{ij} U _{ij} /10 ² /10 ² /10 ² /10 ² -1,18 0,86 1,18 0,86 0,89 0,71 0,29 0,74	CSIRO HUT I Dy Uy Dy Uy Dy Jy /10 ² /10 ² /10 ² /10 ² /10 ² /10 ² 0.89 0.71 0.45 0.68 0.01 0.29 0.74 0.73 0.89 1,93	RL (KRIS S) *NIM Up Dy Up Dy Uy 106 ² 107 ² 107 ² 107 ² 107 ² 0.02 2,90 0,66 4,93 0,66 0.02 1,72 0,99 0,25 0,69 0.67 -0,10 0,74 4,04 0,50	NIST *NPL NRC OF Dy Uy Dy Dy <td< th=""><th>PMET OMH "PTB SMU V/ Up, Dy; Up, Dy; Up, Dy; D; D;</th><th>WIIOFI BIPM MSL/IRL U_U D_U U_U D_U U_U 0 0.70 0.64 0.79 0.95 0.8 0 0.70 0.64 0.79 0.06 0.6 0.73 0.8 0.23 0.8 1 0.65 0.57 0.06 0.6 0.85 0.73 0.86 0.73 0.86 0.85 0.73 0.86 0.85 0.73 0.96 0.85 0.73 0.96 0.85 0.73 0.96 0.85 0.87 0.95 0.87 0.96 0.85 0.87 0.85 0.87 0.85 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 <t< th=""><th>ITRI KRISS D_{ij} U_{ij} D_{ij} U_{ij} / 10² / 10² / 10² / 10² 0 2,1 1.6 0,5 1.0 3 0,9 1,5 1,7 1.0 7 -1,2 1,4 1,3 0.6</th><th>NPLI PSB Dij Uij Dij Uij / 10² / 10² / 10² / 10² -2,2 2,7 -0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1</th></t<></th></td<>	PMET OMH "PTB SMU V/ Up, Dy; Up, Dy; Up, Dy; D; D;	WIIOFI BIPM MSL/IRL U _U D _U U _U D _U U _U 0 0.70 0.64 0.79 0.95 0.8 0 0.70 0.64 0.79 0.06 0.6 0.73 0.8 0.23 0.8 1 0.65 0.57 0.06 0.6 0.85 0.73 0.86 0.73 0.86 0.85 0.73 0.86 0.85 0.73 0.96 0.85 0.73 0.96 0.85 0.73 0.96 0.85 0.87 0.95 0.87 0.96 0.85 0.87 0.85 0.87 0.85 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 <t< th=""><th>ITRI KRISS D_{ij} U_{ij} D_{ij} U_{ij} / 10² / 10² / 10² / 10² 0 2,1 1.6 0,5 1.0 3 0,9 1,5 1,7 1.0 7 -1,2 1,4 1,3 0.6</th><th>NPLI PSB Dij Uij Dij Uij / 10² / 10² / 10² / 10² -2,2 2,7 -0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1</th></t<>	ITRI KRISS D _{ij} U _{ij} D _{ij} U _{ij} / 10 ² / 10 ² / 10 ² / 10 ² 0 2,1 1.6 0,5 1.0 3 0,9 1,5 1,7 1.0 7 -1,2 1,4 1,3 0.6	NPLI PSB Dij Uij Dij Uij / 10 ² / 10 ² / 10 ² / 10 ² -2,2 2,7 -0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1
CCPR-K3.b Lab <i>i</i> D, U, / 10 ² / 10 ² BNM-INM 0,80 0,57 CSIC 0,38 0,61 *CSIRO 0,09 0,39 HUT 0,35 0,61	Lab j BNM-INM CSIC 102 V102 V102 -1,18 0,86 1,18 0,86 0,89 0,71 0,29 0,74 0,45 0,26 0,73 0,69	CSIRO HUT II D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} $1/10^2$ 10^2 10^2 10^2 10^2 10^2 0.89 0.71 0.45 0.86 0.11 0.29 0.74 0.89 1.19 0.24 0.74 0.44 0.74 0.46 0.47 0.90 0.44 0.74 0.44 0.74 0.46 0.74 0.46	RL (KRISS) *NIM Up Dp Up Dp Up /10 ² /10 ² /10 ² /10 ² /10 ² 0.79 2.90 0.66 4.93 0.66 0.82 -1.72 0.99 0.25 0.69 0.67 -2.01 0.74 4.04 0.50 0.62 2.45 0.69 4.04 0.63	NIST NPL NRC OF Dy Uy Dy Uy Dy Uy Dy /10 ² /10 ² /10 ² Uy Dy Uy Dy Uy Dy 0.65 0.73 0.77 0.71 0.80 1.17 1.82 0.53 0.76 0.41 0.74 0.38 1.19 0.44 0.24 0.60 0.32 0.74 0.35 1.19 9.43	FMET OMH PTB SMU V/ 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 0/02 <th>NIIOFI BIPM MSL/IRL U / 02 U / 02 U / 02 U / 02 V / 02 U / 02 0 0.76 0.64 0.79 1 0.65 0.67 0.06 0.68 5 0.81 0.54 0.82 0.23 0.8</th> <th>ITRI KRISS Dij Uj Dij Uj O 2.1 1.6 0.5 1.0 0.9 1.5 1.7 1.0 7 -1.2 1.4 1.3 0.6 1.3</th> <th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} /10² /10² /10² 10² 2.2 2.7 0.5 1.3 -1.0 2.7 0.7 1.3 -1.4 2.5 0.3 1,1</th>	NIIOFI BIPM MSL/IRL U / 02 U / 02 U / 02 U / 02 V / 02 U / 02 0 0.76 0.64 0.79 1 0.65 0.67 0.06 0.68 5 0.81 0.54 0.82 0.23 0.8	ITRI KRISS Dij Uj Dij Uj O 2.1 1.6 0.5 1.0 0.9 1.5 1.7 1.0 7 -1.2 1.4 1.3 0.6 1.3	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij} /10 ² /10 ² /10 ² 10 ² 2.2 2.7 0.5 1.3 -1.0 2.7 0.7 1.3 -1.4 2.5 0.3 1,1
CCPR-K3.b Lab <i>i</i> D, <i>U</i> , <i>i</i> / 0 ² / 10 ² / 10 ² BINM-INM 0,80 0,57 CSIC 0,38 0,61 "CSIRO 0,09 0,39 HUT 0,35 0,61 IRL 0,81 0,51 (KILES) 2 10 0,51	Lab j CSIC M Dy Uy Dy Uy /102 /102 Uy 1,118 0,86 0,73 0,45 0,86 0,73 0,99 0,41 0,79 1,19 0,82 0,45 0,86 0,73 0,99 0,01 0,79 1,19 0,82	CSIRO HUT III D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} 10^2 10^2 10^2 10^2 10^2 10^2 0.89 0.71 0.45 0.86 0.71 0.89 1.19 0.29 0.74 0.74 0.74 0.90 0.44 0.74 0.90 0.44 0.74 0.64 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24	RL (KRISS) *NIM U ₀ D ₀ U ₀ D ₀ U ₀ / 10 ² / 10 ² / 10 ² 10 ² 0.0 0.79 .200 0.66 0.93 0.66 0.62 .1.72 0.80 0.25 0.83 0.67 .201 0.74 .044 0.50 0.62 .2.45 0.83 0.84 0.69 0.82 .2.51 0.93 0.94 0.61 0.82 .2.91 0.82 .0.94 0.60 0.82 .0.93 0.93 0.94 0.61 0.82 .0.94 0.93 0.94 0.91	NIST NPL NRC OF D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} 10^2 10^2 10^2 10^2 10^2 D_{ij} U_{ij} D_{ij} 0.65 0.73 0.77 0.71 0.788 1.17 4.82 0.53 0.76 0.41 0.74 0.38 1.19 0.64 0.24 0.60 0.12 0.57 0.04 0.35 1.19 0.64 0.20 0.63 0.24 0.32 0.74 0.35 1.19 0.33 0.66 0.82 0.74 0.35 1.15 1.33 0.66 0.87 0.67 0.84 1.15 1.48 0.22 0.76 0.87 0.24 0.15 1.97	FRET. OMH "PTB SMU V/ U ₀ D ₀ ₀ <	NIIOFI BIPM MSL/IRL U ₀ D ₀ U ₀ D ₀ U ₀ 0 1/02 /102 /102 U ₀ U ₀ 0 0.78 0.64 0.79 0.95 0.8 0.81 0.54 0.23 0.8 1 0.65 0.25 0.7 0.06 0.50 0.8 0.95 0.8 0.19 0.27 0.06 0.5 0.75 0.90 0.23 0.8 0.05 0.7 0.06 0.5 0.50 0.8 0.19 0.82 0.23 0.8 0.0 0.8 0.50 0.8 0.50 0.8 0.9 0.95 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 <	ITRI KRISS Dy Uy Dy Uy 102 / 102 / 102 / 102 2 1.02 1.02 5.10 3 0.9 1.5 1.7 1.0 3 -1.2 1.4 1.3 0.6 2.1 1.6 0.5 0.8 2.7	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij} /102 /102 /102 103 -2,2 2,7 0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1 -8,2 2,6 0,6 1,2
CCPR-K3.b Lab <i>i</i> D ₁ V ₁ / 10 ² / 10 ² BMM_INM 0.80 0.57 CSIC 0.38 0.61 "CSIRO 0.99 0.39 HUT 0.35 0.61 IRL 0.81 0.51 (KRISS) 2,10 0.64 "NIM 0.13 0.30	Lab j CSIC N Dy Uy Dy Uy /102 /102 /102 /102 /112 /102 /102 /102 1.18 0.86 0.73 0.74 0.45 0.86 0.73 0.79 0.01 0.79 1.19 0.82 2.90 0.86 0.72 0.69 0.93 0.66 0.25 0.69	CSIRO HUT II D _{ij} U _{ij} D _{ij} U _{ij} D _{ij} 10 ² 10 ² 10 ² 10 ² 10 ² 9,80 0,71 0,45 0,86 1,19 0,49 0,74 0,74 0,89 1,19 0,40 0,74 0,74 0,89 1,19 0,44 0,74 0,90 0,67 0,86 0,82 2,010 0,67 0,46 0,82 2,91 0,91 5,90 9,94 0,04 0,80 0,84 0,89 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91 9,91	RL OKRNSS *NIM U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} /10 ² /10 ² /10 ² 0.6 ² 0.6 ² 0.79 2.90 0.68 0.92 0.69 0.69 0.62 -1.72 0.89 0.25 0.69 0.69 0.62 -2.01 0.74 4.04 0.60 0.69 0.61 0.69 0.64 0.69 0.61 0.61 0.61 0.61 0.61 0.61 0.69 0.64 0.69 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.64 0.69 0.64 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 <	NIST NPL NRC OF D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} 10^{2} 10^{2} 10^{2} 10^{2} 10^{2} D_{ij} $D_$	FMET OMH PTB SMU V/ U ₀ <th>NIIOFI BIPM MSL/IRL U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} 10^{ij} /10² /10² U_{ij} U_{ij} U_{ij} 0 0.78 0.64 0.79 0.95 0.8 1 0.64 0.79 0.02 0.23 0.8 1 0.65 0.25 0.67 4.06 0.06 0.25 1 0.65 0.75 0.90 0.8 1.050 0.8 1 0.74 0.85 0.75 4.96 0.0 0.0 0 0.81 2.26 0.85 1.95 0.8 0.00 0.10 0.23 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.00 0.10 0.00 0.10 0.00 0.10 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00<!--</th--><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} $/10^2$ /10^2 /10^2 /10^2 $2,2$ 2,7 $0,5$ $1,3$ $1,0$ $2,7$ $0,7$ $1,7$ $1,4$ $2,5$ $0,3$ $1,1$ $1,8$ $2,7$ $0,1$ $1,2$ $1,3$ $2,6$ $0,6$ $1,2$</th></th>	NIIOFI BIPM MSL/IRL U _{ij} D _{ij} U _{ij} D _{ij} U _{ij} 10 ^{ij} /10 ² /10 ² U _{ij} U _{ij} U _{ij} 0 0.78 0.64 0.79 0.95 0.8 1 0.64 0.79 0.02 0.23 0.8 1 0.65 0.25 0.67 4.06 0.06 0.25 1 0.65 0.75 0.90 0.8 1.050 0.8 1 0.74 0.85 0.75 4.96 0.0 0.0 0 0.81 2.26 0.85 1.95 0.8 0.00 0.10 0.23 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.00 0.10 0.00 0.10 0.00 0.10 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 </th <th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th> <th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} $/10^2$ /10^2 /10^2 /10^2 $2,2$ 2,7 $0,5$ $1,3$ $1,0$ $2,7$ $0,7$ $1,7$ $1,4$ $2,5$ $0,3$ $1,1$ $1,8$ $2,7$ $0,1$ $1,2$ $1,3$ $2,6$ $0,6$ $1,2$</th>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} $/10^2$ /10^2 /10^2 /10^2 $2,2$ 2,7 $0,5$ $1,3$ $1,0$ $2,7$ $0,7$ $1,7$ $1,4$ $2,5$ $0,3$ $1,1$ $1,8$ $2,7$ $0,1$ $1,2$ $1,3$ $2,6$ $0,6$ $1,2$
CCPR-K3.b Lab <i>i</i> <i>D</i> <i>D</i> <i>D</i> <i>D</i> <i>D</i> <i>D</i> <i>D</i> <i>D</i>	Lab j CSIC D _H U _H D _H U _H D ₁₀ U _H D ₁₀ U _H 10 ² 0.89 0.71 0.29 0.74 0.40 0.73 0.89 0.73 0.89 0.90 0.41 0.82 0.93 0.65 0.63 0.75 0.65 0.73 0.85 0.72 0.85 0.75 0.85	Dig Ug Dig Dig <t< th=""><th>RL (KRIS) *NIM Uy Dy Uy Dy Uy 10° 10° 10° 10° 10° 0,72 2,90 0,66 0,93 0,66 0,67 2,17 0,69 0,25 0,69 0,67 2,01 0,74 0,40 0,50 0,82 2,34 0,89 9,48 0,51 0,82 1,97 0,89 0,61 0,51 0,66 4,27 0,76 0,28 0,51 0,61 2,245 0,76 0,28 0,51 0,66 2,22 0,76 0,28 0,53</th><th>NIST *NPL NRC OF Dy Uy Dy Uy Dy Uy Dy 405 0.73 4.77 0.71 4.82 1.92 1.92 0.65 0.73 4.77 0.71 4.88 1.12 4.82 0.43 0.60 0.41 0.74 0.38 1.12 4.82 0.43 0.60 0.76 0.42 0.60 0.99 1.99 4.93 0.20 0.76 0.72 0.74 0.38 1.19 1.43 0.26 0.76 0.72 0.74 0.36 1.19 1.19 0.26 0.76 0.72 0.74 0.81 1.15 1.83 2.25 0.76 2.73 0.74 2.081 1.19 1.08 0.28 0.53 0.16 0.50 0.13 1.06 4.99 0.26 0.53 0.15 0.15 1.16 4.93</th><th>FMET. OMH "PTB SMU V/ Uy Dy <</th><th>WIIOFI BIPM MSL/IRL U_g D_g U_g D_g U_g 2 /102 /102 /102 /102 /102 0 0.73 0.64 0.73 0.95 0.8 1 0.65 0.82 0.73 0.96 0.95 1 0.65 0.65 0.75 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.95 0.86 0.91 0.86 0.91 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.87 0.96 0.92 0.86 0.92 0.86 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} /10² /10² /10² /10² 2,2 2,7 0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1 -1,8 2,7 0,1 1,3 -2,2 2,6 0,6 1,2 -1,3 2,6 0,4 1,2 -1,5 2,6 0,2 1,3 </th></t<>	RL (KRIS) *NIM Uy Dy Uy Dy Uy 10° 10° 10° 10° 10° 0,72 2,90 0,66 0,93 0,66 0,67 2,17 0,69 0,25 0,69 0,67 2,01 0,74 0,40 0,50 0,82 2,34 0,89 9,48 0,51 0,82 1,97 0,89 0,61 0,51 0,66 4,27 0,76 0,28 0,51 0,61 2,245 0,76 0,28 0,51 0,66 2,22 0,76 0,28 0,53	NIST *NPL NRC OF Dy Uy Dy Uy Dy Uy Dy 405 0.73 4.77 0.71 4.82 1.92 1.92 0.65 0.73 4.77 0.71 4.88 1.12 4.82 0.43 0.60 0.41 0.74 0.38 1.12 4.82 0.43 0.60 0.76 0.42 0.60 0.99 1.99 4.93 0.20 0.76 0.72 0.74 0.38 1.19 1.43 0.26 0.76 0.72 0.74 0.36 1.19 1.19 0.26 0.76 0.72 0.74 0.81 1.15 1.83 2.25 0.76 2.73 0.74 2.081 1.19 1.08 0.28 0.53 0.16 0.50 0.13 1.06 4.99 0.26 0.53 0.15 0.15 1.16 4.93	FMET. OMH "PTB SMU V/ Uy Dy <	WIIOFI BIPM MSL/IRL U _g D _g U _g D _g U _g 2 /102 /102 /102 /102 /102 0 0.73 0.64 0.73 0.95 0.8 1 0.65 0.82 0.73 0.96 0.95 1 0.65 0.65 0.75 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.95 0.86 0.91 0.86 0.91 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.86 0.92 0.87 0.96 0.92 0.86 0.92 0.86 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87 0.92 0.87	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NPLI PSB D _{ij} U _{ij} D _{ij} U _{ij} /10 ² /10 ² /10 ² /10 ² 2,2 2,7 0,5 1,3 -1,0 2,7 0,7 1,3 -1,4 2,5 0,3 1,1 -1,8 2,7 0,1 1,3 -2,2 2,6 0,6 1,2 -1,3 2,6 0,4 1,2 -1,5 2,6 0,2 1,3
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0.67 2.10 0.82 0.94 0.61 0.75 0.67 2.10 0.62 0.99 0.61 0.75 2.26 0.29 0.61 0.74 4.80 0.81 0.77 0.52 0.92<td>NIST NPL NRC OF D_y U_y D_y U_y D_y U_y D_y 10^2 10^2 10^2 U_y D_y U_y D_y 40^5 0.73 0.77 0.71 0.80 1.17 4.82 0.53 0.76 0.41 0.74 0.83 1.19 4.82 0.24 0.60 0.12 0.57 0.91 1.19 4.93 0.24 0.60 0.57 0.81 1.15 4.83 2.25 0.76 2.74 0.26 1.19 1.08 0.20 0.53 0.66 0.57 0.81 1.15 4.33 0.20 0.53 0.66 0.57 0.15 1.19 1.08 0.20 0.53 0.66 0.57 0.31 1.06 0.57 0.50 0.80 0.30 0.57 0.33</td><td>FMET OMH PTB SMU V/ 0p Dy <td< td=""><td>NIIOFI BIPM MSU/IRL U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} 102^{-7} 102^{-7} 102^{-7} 102^{-7} 103^{-7} 0.72^{-7} 0.64 0.72 0.64 0.72^{-7} 0.60^{-7} 106^{-7} 0.64 0.72^{-7} 0.66^{-7} 0.76^{-7} 0.76^{-7} 10.65^{-7} 0.75^{-7} 0.96^{-7} 0.96^{-7} 0.96^{-7} 0.81^{-7} 0.75^{-7} 0.96^{-7} 0.30^{-7} 0.30^{-7} 0.61^{-7} 0.75^{-7} 0.75^{-7} 0.75^{-7} 0.75^{-7} 0.74^{-1} 0.16^{-7} 0.75^{-7} 0.76^{-7} 0.72^{-7} 0.74^{-1} 0.66^{-7} 0.87^{-7} 0.72^{-7} 0.72^{-7} 0.74^{-7} 0.76^{-7} 0.87^{-7} 0.72^{-7} 0.72^{-7} 0.74^{-7} 0.31^{-7} 0.76^{-7} 0.76^{-7}</td><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td><td>NPLI PSB Dy Uy Dy Uy /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /103 /102 27 0.7 1.3 1.4 2.5 0.3 1.3 1.4 2.6 0.4 1.2 1.3 2.6 0.4 1.2 1.6 2.6 0.4 1.2 1.6 2.6 0.2 1.3 1.4 2.6 0.3 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.7 1.3 1.6 2.7 0.1 1.3 1.6 3.0 0.1 2.0 1.1 2.6 0.6 1.3 1.5 2.7 0.1 1.3</td></td<></td></td>	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	RL (KRIS) "NIM U_g D_g U_g D_g U_g 10^2 10^2 10^2 10^2 10^2 10^2 0.79 2.90 0.66 0.93 0.66 0.82 1.72 0.99 0.25 0.69 0.67 2.01 0.74 0.40 0.50 0.62 77 0.99 0.48 0.99 0.61 2.91 0.82 0.48 0.53 0.62 791 0.82 0.48 0.53 0.62 2.91 0.82 0.48 0.53 0.62 2.76 0.76 0.48 0.53 0.67 2.10 0.82 0.94 0.61 0.75 0.67 2.10 0.62 0.99 0.61 0.75 2.26 0.29 0.61 0.74 4.80 0.81 0.77 0.52 0.92 <td>NIST NPL NRC OF D_y U_y D_y U_y D_y U_y D_y 10^2 10^2 10^2 U_y D_y U_y D_y 40^5 0.73 0.77 0.71 0.80 1.17 4.82 0.53 0.76 0.41 0.74 0.83 1.19 4.82 0.24 0.60 0.12 0.57 0.91 1.19 4.93 0.24 0.60 0.57 0.81 1.15 4.83 2.25 0.76 2.74 0.26 1.19 1.08 0.20 0.53 0.66 0.57 0.81 1.15 4.33 0.20 0.53 0.66 0.57 0.15 1.19 1.08 0.20 0.53 0.66 0.57 0.31 1.06 0.57 0.50 0.80 0.30 0.57 0.33</td> <td>FMET OMH PTB SMU V/ 0p Dy <td< td=""><td>NIIOFI BIPM MSU/IRL U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} 102^{-7} 102^{-7} 102^{-7} 102^{-7} 103^{-7} 0.72^{-7} 0.64 0.72 0.64 0.72^{-7} 0.60^{-7} 106^{-7} 0.64 0.72^{-7} 0.66^{-7} 0.76^{-7} 0.76^{-7} 10.65^{-7} 0.75^{-7} 0.96^{-7} 0.96^{-7} 0.96^{-7} 0.81^{-7} 0.75^{-7} 0.96^{-7} 0.30^{-7} 0.30^{-7} 0.61^{-7} 0.75^{-7} 0.75^{-7} 0.75^{-7} 0.75^{-7} 0.74^{-1} 0.16^{-7} 0.75^{-7} 0.76^{-7} 0.72^{-7} 0.74^{-1} 0.66^{-7} 0.87^{-7} 0.72^{-7} 0.72^{-7} 0.74^{-7} 0.76^{-7} 0.87^{-7} 0.72^{-7} 0.72^{-7} 0.74^{-7} 0.31^{-7} 0.76^{-7} 0.76^{-7}</td><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td><td>NPLI PSB Dy Uy Dy Uy /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /103 /102 27 0.7 1.3 1.4 2.5 0.3 1.3 1.4 2.6 0.4 1.2 1.3 2.6 0.4 1.2 1.6 2.6 0.4 1.2 1.6 2.6 0.2 1.3 1.4 2.6 0.3 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.2 1.3 1.4 2.6 0.7 1.3 1.6 2.7 0.1 1.3 1.6 3.0 0.1 2.0 1.1 2.6 0.6 1.3 1.5 2.7 0.1 1.3</td></td<></td>	NIST NPL NRC OF D_y U_y D_y U_y D_y U_y D_y 10^2 10^2 10^2 U_y D_y U_y D_y 40^5 0.73 0.77 0.71 0.80 1.17 4.82 0.53 0.76 0.41 0.74 0.83 1.19 4.82 0.24 0.60 0.12 0.57 0.91 1.19 4.93 0.24 0.60 0.57 0.81 1.15 4.83 2.25 0.76 2.74 0.26 1.19 1.08 0.20 0.53 0.66 0.57 0.81 1.15 4.33 0.20 0.53 0.66 0.57 0.15 1.19 1.08 0.20 0.53 0.66 0.57 0.31 1.06 0.57 0.50 0.80 0.30 0.57 0.33	FMET OMH PTB SMU V/ 0p Dy Dy <td< td=""><td>NIIOFI BIPM MSU/IRL U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} U_{μ} D_{ij} U_{μ} D_{ij} U_{μ} 102^{-7} 102^{-7} 102^{-7} 102^{-7} 103^{-7} 0.72^{-7} 0.64 0.72 0.64 0.72^{-7} 0.60^{-7} 106^{-7} 0.64 0.72^{-7} 0.66^{-7} 0.76^{-7} 0.76^{-7} 10.65^{-7} 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CCPR-K3.b Lab / D, U/0 / 10 ² / 10 ² BNM-INM 0,80 0,57 CSIC 0,38 0,61 CSIC 0,09 0,39 HUT 0,35 0,61 IRL 0,81 0,51 (KRISS) 2,10 0,64 TNIM 0,13 0,30 NIST 0,45 NIST 0,45 NIST 0,45 NIST 0,45 NIST 0,45 NIST 0,57 SMU 0,24 1,54 VMI0FI 0,36 0,49 BIPM 0,16 0,51 MSL/IRL 0,15 0,52 APMP.PR-K3.b ITRI 1,3 1,4 KBISS 4,3 0,8	Lab j → BNM-INM CSIC N Dy Uy Dy Uy /102 /102 /102 /102 /102 /102 /102 /102 -1,18 0,86 -1,18 0,86 0,89 0,71 0,29 0,74 0,45 0,86 0,73 0,83 0,01 0,79 0,82 0,89 0,65 0,73 0,38 1,93 0,65 0,73 0,38 1,07 0,86 1,72 0,88 1,72 0,65 0,73 0,38 1,09 0,80 1,71 0,41 0,74 0,80 1,75 0,64 0,62 0,43 0,83 0,75 0,64 0,79 0,64 0,79 0,40 0,82 0,64 0,79 0,54 0,82 0,83 0,64 0,79 0,54 0,82 0,83 <	CSIRO HUT I Dy Uy Dy Uy Dy 102 102 102 102 102 102 102 0.74 0.76 0.89 0.71 0.45 0.66 0.01 0.89 0.71 0.45 0.66 0.01 0.29 0.74 0.73 0.89 1.99 0.04 0.74 0.74 0.74 0.78 0.84 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.75 0.74 0.74 0.74 0.75 0.74 1.64	RL (KRIS) "NIM Uy Dy Uy Dy Uy /102 /102 /102 Uy Dy Uy /102 /102 /102 /102 Uy Dy Uy /102 /102 /102 /102 /102 /102 /102 /032 -102 0,50 0,60 0,61 0,93 0,66 0,62 -1,72 0,59 0,25 0,59 0,61 0,61 0,62 -2,41 0,78 -0,40 0,50 0,61 0,61 0,62 -2,91 0,62 0,82 0,63 0,61 0,62 0,53 0,65 0,53 0,56 0,50 0,56 0,50 0,66 0,50 0,66 0,50 0,66 0,50 0,66 0,50 0,66 0,50 0,66 0,50 0,66 0,50 0,67 0,24 0,80 0,61 0,70 0,70 0,22 0,42 0,84 <	NIST NPL NRC OF D_{31} U_{32}	FMET OMH PTB SMU V/ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <td< th=""><th>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</th><th>ITRI KRISS J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} I_{ij} I_{ij} I_{ij} I_{ij} J_{ij} I_{ij} I_{ij}</th><th>NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} 10^2 10^2 10^2 10^2 $2,2$ $2,7$ $0,7$ $1,3$ $1,0$ $2,7$ $0,7$ $1,3$ $1,4$ 25 $0,3$ $1,1$ $1,8$ $2,7$ $0,1$ $1,3$ $2,2$ $2,6$ $0,6$ $1,2$ $1,3$ $2,6$ $0,2$ $1,3$ $1,4$ $2,6$ $0,4$ $1,2$ $1,6$ $2,7$ $0,1$ $1,3$ $1,4$ $2,6$ $0,2$ $1,3$ $1,4$ $2,6$ $0,3$ $1,3$ $1,4$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,6$ $3,0$ $0,1$</th></td<>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ITRI KRISS J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} U_{ij} U_{ij} U_{ij} J_{ij} I_{ij} I_{ij} I_{ij} I_{ij} J_{ij} I_{ij}	NPLI PSB D_{ij} U_{ij} D_{ij} U_{ij} 10^2 10^2 10^2 10^2 $2,2$ $2,7$ $0,7$ $1,3$ $1,0$ $2,7$ $0,7$ $1,3$ $1,4$ 25 $0,3$ $1,1$ $1,8$ $2,7$ $0,1$ $1,3$ $2,2$ $2,6$ $0,6$ $1,2$ $1,3$ $2,6$ $0,2$ $1,3$ $1,4$ $2,6$ $0,4$ $1,2$ $1,6$ $2,7$ $0,1$ $1,3$ $1,4$ $2,6$ $0,2$ $1,3$ $1,4$ $2,6$ $0,3$ $1,3$ $1,4$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,1$ $2,6$ $0,7$ $1,3$ $1,6$ $3,0$ $0,1$
CCPR-K3.b Lab /	Lab j → BNM-INM CSIC N Dy Uy Dy Uy 102 / 102 / 102 -1.18 0.66 118 0.86 -1.18 0.66 0.89 0.71 0.29 0.74 0.45 0.66 0.73 0.89 0.01 0.79 0.47 0.66 0.70 0.86 1.72 0.69 0.93 0.66 0.73 0.89 0.93 0.66 0.73 0.89 0.93 0.66 0.73 0.89 0.65 0.73 0.53 0.76 0.77 0.71 0.41 0.74 0.80 1.17 0.33 1.19 1.82 0.79 0.54 0.82 0.56 1.66 0.62 1.67 0.56 1.66 0.62 0.83 0.54 0.79 0.54 0.82 0.95 0.80 0.23 0.83	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	RL (KRISS) "NIM Uy Dy Uy Dy Uy /162 /162 /162 /162 /162 0/0 2,90 0,66 0,93 0,66 0/2 2,90 0,66 0,93 0,66 0/2 2,90 0,66 0,93 0,66 0/2 1,72 0,89 0,25 0,89 0,67 2,01 0,62 0,94 0,61 0,82 2,45 0,89 -0,64 0,59 0,61 1,97 0,99 - 0,69 0,62 -1,97 0,99 - 0,63 0,61 0,67 2,13 0,74 0,46 0,50 0,63 0,66 0,50 0,67 0,74 0,68 0,50 0,65 0,66 0,66 0,60 0,66 0,60 0,66 0,66 0,66 0,66 0,66 0,66 0,66 0,66 0,66 0,66 0,66 0,66<	NIST NPL NRC OF D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} 10^2 10^2 U_{ij} D_{ij} U_{ij} D_{ij} U_{ij} D_{ij} 0.65 0.73 0.77 0.71 0.80 1.17 4.82 0.53 0.76 0.41 0.74 0.35 1.19 0.44 0.24 0.60 0.12 0.57 0.99 1.09 0.33 0.20 0.66 0.74 0.55 0.13 1.19 0.40 0.22 0.76 0.22 0.74 0.55 1.11 1.17 0.22 0.53 0.67 0.13 1.106 0.47 0.66 0.12 0.50 0.51 1.11 0.67 0.31 1.09 -1.22 0.73 0.66 0.56 0.35 1.09 0.57 0.31	FNET OMH PTB SMU V/ Ug Dg Dg Ug Dg Dg <td< th=""><th>NIIOFI BIPM MSU/IRL y_{μ} D_{μ} U_{μ} D_{μ} U_{μ} 102^{2} 0.64 0.72 0.66 0.53 0.81 0.66 0.55 0.81 0.95 0.81 0.95 0.81 0.92 0.61 0.62 0.87 0.7 0.74 0.65 0.20 0.87 0.7 0.74 0.41 0.3 0.74 0.31 0.76 0.74 0.66 0.74 0.76 0.74 0.31 0.76</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB Dy Uy Dy Uy /10² /10² /10² /10² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,1 1,8 2,7 0,4 1,2 -1,3 2,6 0,4 1,2 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,4 1,2 1,4 2,6 0,3 1,6 0,4 2,7 1,3 1,6 1,4 2,6 0,3 1,6 0,4 2,7 1,3 1,6 1,5 3,0 0,1 1,3 1,6 2,7 0,1 1,3 1,6 2,7 0,1 1,3 1,6 2,6 0,4 1,2 0,1 3,0 1,5 1,8</th></td<>	NIIOFI BIPM MSU/IRL y_{μ} D_{μ} U_{μ} D_{μ} U_{μ} 102^{2} 0.64 0.72 0.66 0.53 0.81 0.66 0.55 0.81 0.95 0.81 0.95 0.81 0.92 0.61 0.92 0.61 0.92 0.61 0.92 0.61 0.92 0.61 0.92 0.61 0.92 0.61 0.92 0.61 0.62 0.87 0.7 0.74 0.65 0.20 0.87 0.7 0.74 0.41 0.3 0.74 0.31 0.76 0.74 0.66 0.74 0.76 0.74 0.31 0.76	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NPLI PSB Dy Uy Dy Uy /10 ² /10 ² /10 ² /10 ² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,1 1,8 2,7 0,4 1,2 -1,3 2,6 0,4 1,2 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,4 1,2 1,4 2,6 0,3 1,6 0,4 2,7 1,3 1,6 1,4 2,6 0,3 1,6 0,4 2,7 1,3 1,6 1,5 3,0 0,1 1,3 1,6 2,7 0,1 1,3 1,6 2,7 0,1 1,3 1,6 2,6 0,4 1,2 0,1 3,0 1,5 1,8
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CCPR-K3.b Lab / D, U/ / 10 ² / 10 ² EMM-INM 0,80 0,57 CSIC 0,38 0,61 'CSIRO 0,09 0,39 HUT 0,35 0,61 (KRISS) 2,10 0,64 'NM 0,13 0,30 HIST 0,45 0,45 'NPL 0,03 0,49 NIST 0,45 0,45 'NPL 0,03 0,49 HIST 0,45 0,45 'NPL 0,37 0,57 'PTB 0,37 0,57 'PTB 0,36 0,37 SMU 0,24 1,54 VHIOFI 0,38 0,49 BIPM 0,16 0,51 MSL/IRL 0,15 0,52 APMP.PR-K3.b ITRI 1,3 1,4 KRISS 4,3 0,8 NPL1 1,4 2,6 PSB 0,3 1,2 'Lab the weight ap	Lab j CSIC N Dy Uy Dy Uy /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /102 /103 0.90 0.71 4.29 0.74 0.45 0.86 0.73 0.93 0.60 0.72 0.61 0.73 4.93 0.93 0.66 0.65 0.77 0.74 0.41 0.74 0.63 0.73 4.93 0.75 0.65 0.77 0.74 0.41 0.74 0.60 1.72 0.83 0.74 0.83 0.75 0.64 0.82 0.75 0.64 0.82 0.74 0.74 0.75 0.64 0.82 0.83 0.74 0.54 0.82 0.83 0.74 0.54 0.82 0.83 0.83 <t< th=""><th>CSIRO HUT II Dy Uy Dy Uy Dy /10² J0² Uy Dy Uy Dy 0.480 O,71 0.45 0.66 0.61 0.29 O,74 0.74 0.90 0.64 0.74 0.74 0.90 D,67 0.46 0.82 2.91 0.74 2.45 0.69 2.91 0.40 0.50 0.48 0.69 0.92 0.76 0.66 0.61 0.92 0.76 0.48 0.93 0.93 0.93 0.93 0.93 0.93 0.94 0.90 0.90 0.90 0.90 0.90 0.90 0.96 1.43 0.64 0.93 0.93 0.93 0.93 0.93 0.91</th><th>RL (KRISS) "NIM Ug Dg Ug Dg Ug 10² 10² 10² Ug Dg Ug 10² 10² 10² 10² 10² 10² 0.73 2,90 0,66 4,93 0,66 0,62 10² 0,67 2,01 0,74 0,40 0,50 0,93 0,66 0,67 2,01 0,74 0,40 0,50 0,93 0,61 0,62 2,91 0,72 0,90 0,40 0,50 0,60 0,62 0,93 0,61 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,61 0,70 0,72 0,40 0,81 0,41 0,53 0,61 0,75 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,61 0,75 0,76 0,20 0,81 0,1</th><th>NIST NPL NRC OF Dy Uy Dy <td< th=""><th>FMET OMH PTB SMU V/ 0m <td< th=""><th>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB Dy Uy Dy Uy /10² /10² /10² /10² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,3 2,2 2,6 0,6 1,2 1,3 2,6 0,4 1,2 1,5 2,6 0,4 1,2 1,6 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,1 1,3 1,4 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,7 1,3 1,6 3,0 0,1 2,0 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2</th></td<></th></td<></th></t<>	CSIRO HUT II Dy Uy Dy Uy Dy /10 ² J0 ² Uy Dy Uy Dy 0.480 O,71 0.45 0.66 0.61 0.29 O,74 0.74 0.90 0.64 0.74 0.74 0.90 D,67 0.46 0.82 2.91 0.74 2.45 0.69 2.91 0.40 0.50 0.48 0.69 0.92 0.76 0.66 0.61 0.92 0.76 0.48 0.93 0.93 0.93 0.93 0.93 0.93 0.94 0.90 0.90 0.90 0.90 0.90 0.90 0.96 1.43 0.64 0.93 0.93 0.93 0.93 0.93 0.91	RL (KRISS) "NIM Ug Dg Ug Dg Ug 10 ² 10 ² 10 ² Ug Dg Ug 10 ² 10 ² 10 ² 10 ² 10 ² 10 ² 0.73 2,90 0,66 4,93 0,66 0,62 10 ² 0,67 2,01 0,74 0,40 0,50 0,93 0,66 0,67 2,01 0,74 0,40 0,50 0,93 0,61 0,62 2,91 0,72 0,90 0,40 0,50 0,60 0,62 0,93 0,61 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,61 0,70 0,72 0,40 0,81 0,41 0,53 0,61 0,75 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,60 0,61 0,75 0,76 0,20 0,81 0,1	NIST NPL NRC OF Dy Uy Dy Dy <td< th=""><th>FMET OMH PTB SMU V/ 0m <td< th=""><th>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB Dy Uy Dy Uy /10² /10² /10² /10² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,3 2,2 2,6 0,6 1,2 1,3 2,6 0,4 1,2 1,5 2,6 0,4 1,2 1,6 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,1 1,3 1,4 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,7 1,3 1,6 3,0 0,1 2,0 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2</th></td<></th></td<>	FMET OMH PTB SMU V/ 0m 0m <td< th=""><th>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</th><th>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</th><th>NPLI PSB Dy Uy Dy Uy /10² /10² /10² /10² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,3 2,2 2,6 0,6 1,2 1,3 2,6 0,4 1,2 1,5 2,6 0,4 1,2 1,6 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,1 1,3 1,4 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,7 1,3 1,6 3,0 0,1 2,0 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2</th></td<>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NPLI PSB Dy Uy Dy Uy /10 ² /10 ² /10 ² /10 ² 2,2 2,7 0,5 1,3 1,0 2,7 0,7 1,3 1,4 2,5 0,3 1,3 2,2 2,6 0,6 1,2 1,3 2,6 0,4 1,2 1,5 2,6 0,4 1,2 1,6 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,1 1,3 1,4 2,6 0,2 1,3 1,4 2,6 0,3 1,3 1,4 2,6 0,7 1,3 1,6 3,0 0,1 2,0 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2 1,1 2,6 0,4 1,2
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