Key comparison CCPR-K2.a

MEASURAND : Spectral responsivity

WAVELENGTH : 900 nm to 1600 nm

The individual measurements of the participating laboratories are given in Section 4 of the CCPR-K2.a Final Report. Examination and correction of the data are explained in Section 5. The data analysis in given in Section 6 and is based on the calculation of the mean relative differences between each participant and the Pilot Laboratory, NIST, weighted by the transfer uncertainty of the measurements of each photodiode, for each wavelength.

For each wavelength, the key comparison reference value is calculated as a weighted mean with cut-off, excluding NMISA and KRISS results (see on page 80 of Section 7 of the CCPR-K2.a Final Report). The value of the cut-off varies with the wavelength and is listed in table 7.17 on page 83 of the Final Report.

The degree of equivalence of each laboratory with respect to the reference value is given by a pair of terms:
D_i and U_i, its expanded uncertainty (k = 2), both expressed in %.

The degree of equivalence between two laboratories is given by a pair of terms:
D_{ij} and U_{ij}, its expanded uncertainty (k = 2), both expressed in %.

Key comparison CCPR-K2.a

Wavelength : 900 nm

Matrix of equivalence (1/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.3**	0.6			**-1.5**	2.7	**-0.5**	0.7	**-0.9**	3.2	**-3.3**	1.4	**-1.5**	1.0	**-4.9**	1.6	**-1.3**	0.7
NMISA	**0.1**	2.6	**1.5**	2.7			**1.0**	2.6	**0.6**	4.1	**-1.8**	2.9	**0.0**	2.7	**-3.4**	3.0	**0.2**	2.6
NMIA	**-0.8**	0.4	**0.5**	0.7	**-1.0**	2.6			**-0.4**	3.2	**-2.8**	1.4	**-1.0**	0.9	**-4.4**	1.5	**-0.8**	0.6
HUT	**-0.4**	3.1	**0.9**	3.2	**-0.6**	4.1	**0.4**	3.2			**-2.4**	3.4	**-0.6**	3.2	**-4.0**	3.4	**-0.4**	3.2
IFA-CSIC	**1.9**	1.3	**3.3**	1.4	**1.8**	2.9	**2.8**	1.4	**2.4**	3.4			**1.8**	1.5	**-1.6**	1.9	**2.0**	1.4
KRISS	**0.1**	0.8	**1.5**	1.0	**0.0**	2.7	**1.0**	0.9	**0.6**	3.2	**-1.8**	1.5			**-3.4**	1.6	**0.2**	0.9
NIM	**3.5**	1.4	**4.9**	1.6	**3.4**	3.0	**4.4**	1.5	**4.0**	3.4	**1.6**	1.9	**3.4**	1.6			**3.5**	1.5
NIST	**0.0**	0.4	**1.3**	0.7	**-0.2**	2.6	**0.8**	0.6	**0.4**	3.2	**-2.0**	1.4	**-0.2**	0.9	**-3.5**	1.5		
VSL	**0.7**	1.2	**2.0**	1.3	**0.5**	2.9	**1.5**	1.3	**1.1**	3.4	**-1.3**	1.8	**0.5**	1.4	**-2.9**	1.9	**0.7**	1.3
NPL	**0.4**	0.4	**1.7**	0.8	**0.2**	2.6	**1.2**	0.6	**0.8**	3.2	**-1.6**	1.4	**0.2**	0.9	**-3.1**	1.5	**0.4**	0.6
NRC	**0.7**	0.4	**2.0**	0.7	**0.5**	2.6	**1.5**	0.6	**1.1**	3.2	**-1.3**	1.4	**0.5**	0.9	**-2.9**	1.5	**0.7**	0.6
MKEH	**0.0**	2.8	**1.3**	2.9	**-0.1**	3.8	**0.8**	2.8	**0.4**	4.2	**-1.9**	3.1	**-0.1**	2.9	**-3.5**	3.2	**0.0**	2.8
PTB	**-0.1**	0.4	**1.2**	0.7	**-0.3**	2.6	**0.7**	0.6	**0.3**	3.2	**-2.1**	1.4	**-0.3**	0.9	**-3.6**	1.5	**-0.1**	0.6
SMU	**0.1**	0.6	**1.5**	0.9	**0.0**	2.7	**1.0**	0.8	**0.6**	3.2	**-1.8**	1.4	**0.0**	1.0	**-3.4**	1.6	**0.1**	0.8
VNIIOFI	**0.3**	1.2	**1.7**	1.4	**0.2**	2.9	**1.2**	1.3	**0.8**	3.4	**-1.6**	1.8	**0.2**	1.5	**-3.2**	1.9	**0.4**	1.3

Key comparison CCPR-K2.a

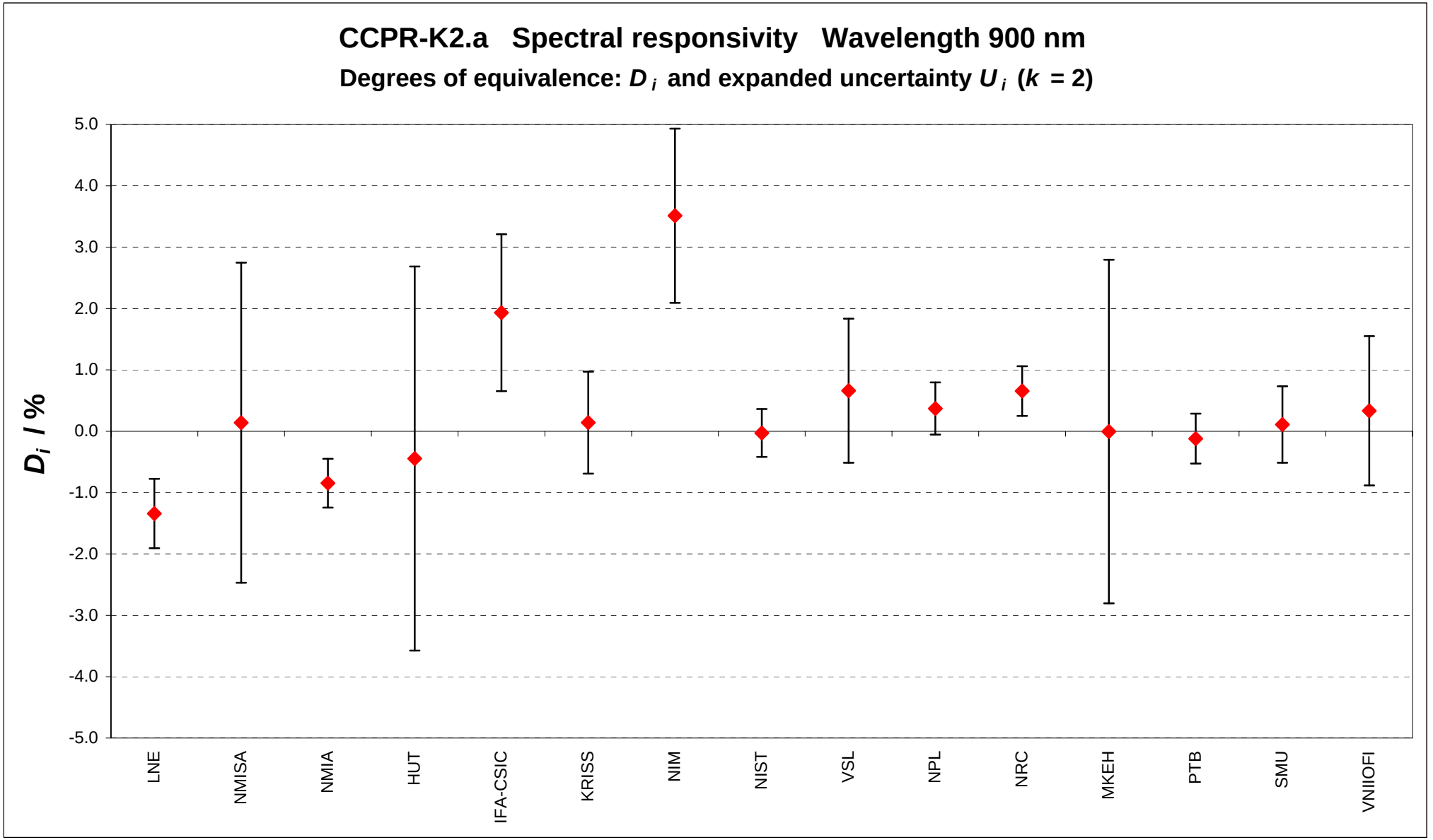
Wavelength : 900 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.3**	0.6	**-2.0**	1.3	**-1.7**	0.8	**-2.0**	0.7	**-1.3**	2.9	**-1.2**	0.7	**-1.5**	0.9	**-1.7**	1.4
NMISA	**0.1**	2.6	**-0.5**	2.9	**-0.2**	2.6	**-0.5**	2.6	**0.1**	3.8	**0.3**	2.6	**0.0**	2.7	**-0.2**	2.9
NMIA	**-0.8**	0.4	**-1.5**	1.3	**-1.2**	0.6	**-1.5**	0.6	**-0.8**	2.8	**-0.7**	0.6	**-1.0**	0.8	**-1.2**	1.3
HUT	**-0.4**	3.1	**-1.1**	3.4	**-0.8**	3.2	**-1.1**	3.2	**-0.4**	4.2	**-0.3**	3.2	**-0.6**	3.2	**-0.8**	3.4
IFA-CSIC	**1.9**	1.3	**1.3**	1.8	**1.6**	1.4	**1.3**	1.4	**1.9**	3.1	**2.1**	1.4	**1.8**	1.4	**1.6**	1.8
KRISS	**0.1**	0.8	**-0.5**	1.4	**-0.2**	0.9	**-0.5**	0.9	**0.1**	2.9	**0.3**	0.9	**0.0**	1.0	**-0.2**	1.5
NIM	**3.5**	1.4	**2.9**	1.9	**3.1**	1.5	**2.9**	1.5	**3.5**	3.2	**3.6**	1.5	**3.4**	1.6	**3.2**	1.9
NIST	**0.0**	0.4	**-0.7**	1.3	**-0.4**	0.6	**-0.7**	0.6	**0.0**	2.8	**0.1**	0.6	**-0.1**	0.8	**-0.4**	1.3
VSL	**0.7**	1.2			**0.3**	1.3	**0.0**	1.3	**0.7**	3.0	**0.8**	1.3	**0.5**	1.4	**0.3**	1.7
NPL	**0.4**	0.4	**-0.3**	1.3			**-0.3**	0.6	**0.4**	2.8	**0.5**	0.6	**0.3**	0.8	**0.0**	1.3
NRC	**0.7**	0.4	**0.0**	1.3	**0.3**	0.6			**0.7**	2.8	**0.8**	0.6	**0.5**	0.8	**0.3**	1.3
MKEH	**0.0**	2.8	**-0.7**	3.0	**-0.4**	2.8	**-0.7**	2.8			**0.1**	2.8	**-0.1**	2.9	**-0.3**	3.1
PTB	**-0.1**	0.4	**-0.8**	1.3	**-0.5**	0.6	**-0.8**	0.6	**-0.1**	2.8			**-0.2**	0.8	**-0.5**	1.3
SMU	**0.1**	0.6	**-0.5**	1.4	**-0.3**	0.8	**-0.5**	0.8	**0.1**	2.9	**0.2**	0.8			**-0.2**	1.4
VNIIOFI	**0.3**	1.2	**-0.3**	1.7	**0.0**	1.3	**-0.3**	1.3	**0.3**	3.1	**0.5**	1.3	**0.2**	1.4		


CCPR-K2.a Spectral responsivity Wavelength 900 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 950 nm

Matrix of equivalence (1/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.2**	0.5			**-1.4**	2.7	**-0.9**	0.7	**-2.1**	3.6	**-2.8**	1.3	**-1.3**	1.0	**-2.6**	1.1	**-1.4**	1.5
NMISA	**0.1**	2.6	**1.4**	2.7			**0.4**	2.6	**-0.7**	4.4	**-1.4**	2.9	**0.1**	2.7	**-1.2**	2.8	**0.0**	2.9
NMIA	**-0.3**	0.3	**0.9**	0.7	**-0.4**	2.6			**-1.2**	3.6	**-1.8**	1.3	**-0.4**	0.9	**-1.6**	1.0	**-0.4**	1.4
HUT	**0.9**	3.6	**2.1**	3.6	**0.7**	4.4	**1.2**	3.6			**-0.6**	3.8	**0.8**	3.7	**-0.4**	3.7	**0.8**	3.8
IFA-CSIC	**1.5**	1.2	**2.8**	1.3	**1.4**	2.9	**1.8**	1.3	**0.6**	3.8			**1.4**	1.5	**0.2**	1.5	**1.4**	1.8
KRISS	**0.1**	0.8	**1.3**	1.0	**-0.1**	2.7	**0.4**	0.9	**-0.8**	3.7	**-1.4**	1.5			**-1.3**	1.2	**-0.1**	1.6
NIM	**1.3**	0.9	**2.6**	1.1	**1.2**	2.8	**1.6**	1.0	**0.4**	3.7	**-0.2**	1.5	**1.3**	1.2			**1.2**	1.6
NIST	**0.1**	1.3	**1.4**	1.5	**0.0**	2.9	**0.4**	1.4	**-0.8**	3.8	**-1.4**	1.8	**0.1**	1.6	**-1.2**	1.6		
VSL	**0.2**	0.9	**1.4**	1.1	**0.0**	2.8	**0.5**	1.0	**-0.7**	3.7	**-1.4**	1.6	**0.1**	1.3	**-1.2**	1.3	**0.0**	1.7
NPL	**0.5**	0.3	**1.7**	0.7	**0.3**	2.6	**0.8**	0.5	**-0.4**	3.6	**-1.0**	1.3	**0.4**	0.9	**-0.9**	1.0	**0.3**	1.4
NRC	**0.0**	0.3	**1.2**	0.6	**-0.1**	2.6	**0.3**	0.5	**-0.9**	3.6	**-1.5**	1.2	**-0.1**	0.9	**-1.3**	1.0	**-0.1**	1.4
MKEH	**-0.4**	2.8	**0.8**	2.8	**-0.6**	3.8	**-0.1**	2.8	**-1.3**	4.6	**-1.9**	3.0	**-0.5**	2.9	**-1.8**	2.9	**-0.6**	3.1
PTB	**-0.2**	0.3	**1.0**	0.6	**-0.4**	2.6	**0.1**	0.5	**-1.1**	3.6	**-1.7**	1.3	**-0.3**	0.9	**-1.5**	1.0	**-0.3**	1.4
SMU	**0.5**	0.5	**1.7**	0.8	**0.4**	2.7	**0.8**	0.6	**-0.4**	3.6	**-1.0**	1.3	**0.4**	1.0	**-0.8**	1.0	**0.4**	1.4
VNIIOFI	**-1.0**	1.0	**0.3**	1.2	**-1.1**	2.8	**-0.7**	1.1	**-1.9**	3.8	**-2.5**	1.6	**-1.0**	1.3	**-2.3**	1.4	**-1.1**	1.7

Key comparison CCPR-K2.a

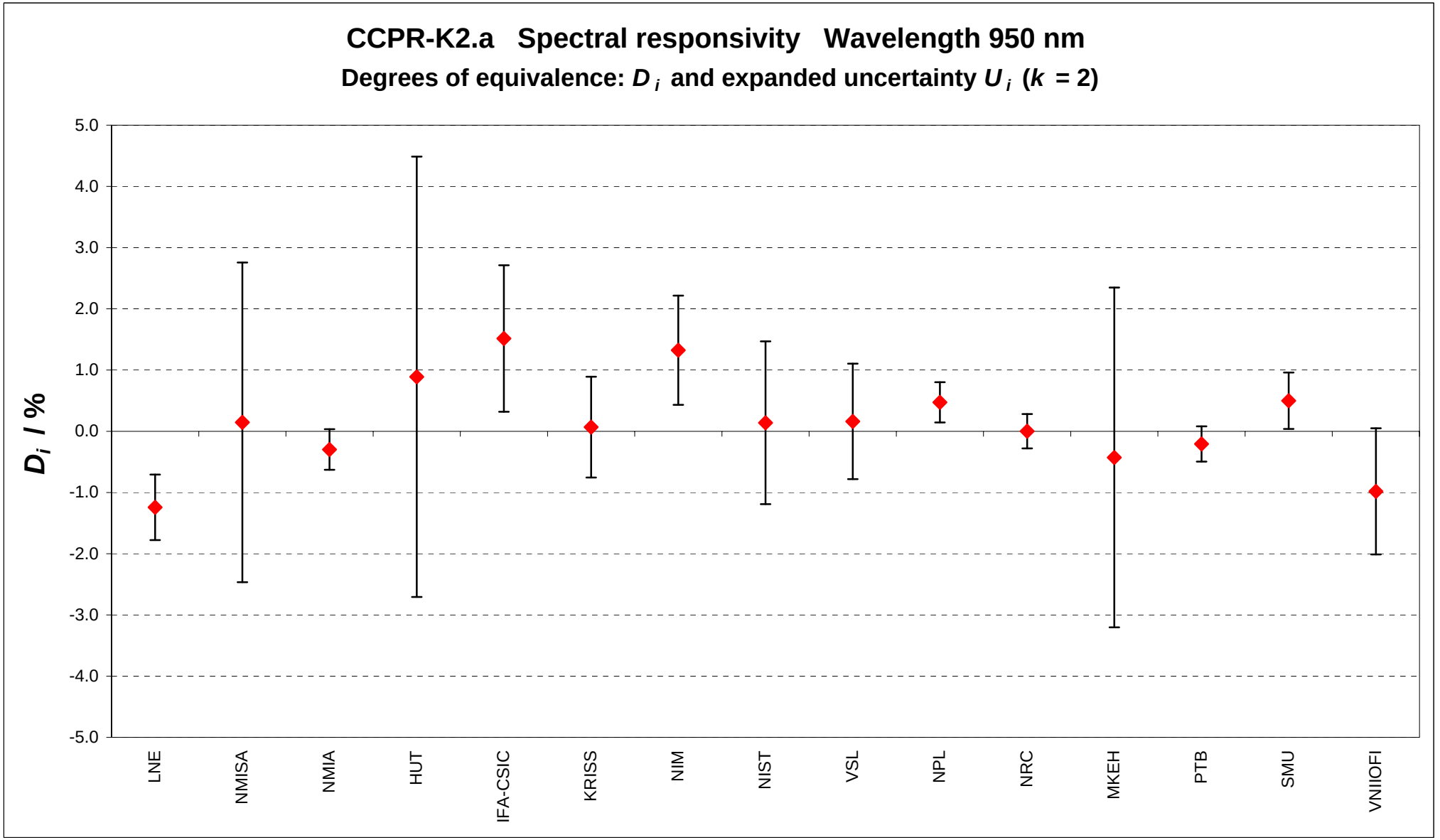
Wavelength : 950 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.2**	0.5	**-1.4**	1.1	**-1.7**	0.7	**-1.2**	0.6	**-0.8**	2.8	**-1.0**	0.6	**-1.7**	0.8	**-0.3**	1.2
NMISA	**0.1**	2.6	**0.0**	2.8	**-0.3**	2.6	**0.1**	2.6	**0.6**	3.8	**0.4**	2.6	**-0.4**	2.7	**1.1**	2.8
NMIA	**-0.3**	0.3	**-0.5**	1.0	**-0.8**	0.5	**-0.3**	0.5	**0.1**	2.8	**-0.1**	0.5	**-0.8**	0.6	**0.7**	1.1
HUT	**0.9**	3.6	**0.7**	3.7	**0.4**	3.6	**0.9**	3.6	**1.3**	4.6	**1.1**	3.6	**0.4**	3.6	**1.9**	3.8
IFA-CSIC	**1.5**	1.2	**1.4**	1.6	**1.0**	1.3	**1.5**	1.2	**1.9**	3.0	**1.7**	1.3	**1.0**	1.3	**2.5**	1.6
KRISS	**0.1**	0.8	**-0.1**	1.3	**-0.4**	0.9	**0.1**	0.9	**0.5**	2.9	**0.3**	0.9	**-0.4**	1.0	**1.0**	1.3
NIM	**1.3**	0.9	**1.2**	1.3	**0.9**	1.0	**1.3**	1.0	**1.8**	2.9	**1.5**	1.0	**0.8**	1.0	**2.3**	1.4
NIST	**0.1**	1.3	**0.0**	1.7	**-0.3**	1.4	**0.1**	1.4	**0.6**	3.1	**0.3**	1.4	**-0.4**	1.4	**1.1**	1.7
VSL	**0.2**	0.9			**-0.3**	1.0	**0.2**	1.0	**0.6**	2.9	**0.4**	1.0	**-0.3**	1.1	**1.1**	1.4
NPL	**0.5**	0.3	**0.3**	1.0			**0.5**	0.5	**0.9**	2.8	**0.7**	0.5	**0.0**	0.6	**1.5**	1.1
NRC	**0.0**	0.3	**-0.2**	1.0	**-0.5**	0.5			**0.4**	2.8	**0.2**	0.4	**-0.5**	0.6	**1.0**	1.1
MKEH	**-0.4**	2.8	**-0.6**	2.9	**-0.9**	2.8	**-0.4**	2.8			**-0.2**	2.8	**-0.9**	2.8	**0.6**	3.0
PTB	**-0.2**	0.3	**-0.4**	1.0	**-0.7**	0.5	**-0.2**	0.4	**0.2**	2.8			**-0.7**	0.6	**0.8**	1.1
SMU	**0.5**	0.5	**0.3**	1.1	**0.0**	0.6	**0.5**	0.6	**0.9**	2.8	**0.7**	0.6			**1.5**	1.2
VNIIOFI	**-1.0**	1.0	**-1.1**	1.4	**-1.5**	1.1	**-1.0**	1.1	**-0.6**	3.0	**-0.8**	1.1	**-1.5**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 950 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1000 nm

Matrix of equivalence (1/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.1**	0.5			**-1.2**	2.7	**-0.7**	0.7	**-1.0**	3.5	**-2.4**	1.3	**-1.4**	1.0	**-2.4**	1.1	**-0.9**	1.1
NMISA	**0.1**	2.6	**1.2**	2.7			**0.5**	2.6	**0.2**	4.3	**-1.2**	2.9	**-0.2**	2.7	**-1.2**	2.8	**0.3**	2.8
NMIA	**-0.4**	0.3	**0.7**	0.7	**-0.5**	2.6			**-0.3**	3.5	**-1.7**	1.2	**-0.7**	0.9	**-1.7**	1.0	**-0.2**	1.0
HUT	**-0.1**	3.5	**1.0**	3.5	**-0.2**	4.3	**0.3**	3.5			**-1.4**	3.7	**-0.4**	3.6	**-1.4**	3.6	**0.1**	3.6
IFA-CSIC	**1.3**	1.2	**2.4**	1.3	**1.2**	2.9	**1.7**	1.2	**1.4**	3.7			**1.0**	1.4	**-0.1**	1.5	**1.4**	1.5
KRISS	**0.3**	0.8	**1.4**	1.0	**0.2**	2.7	**0.7**	0.9	**0.4**	3.6	**-1.0**	1.4			**-1.0**	1.2	**0.5**	1.2
NIM	**1.3**	0.9	**2.4**	1.1	**1.2**	2.8	**1.7**	1.0	**1.4**	3.6	**0.1**	1.5	**1.0**	1.2			**1.5**	1.3
NIST	**-0.2**	0.9	**0.9**	1.1	**-0.3**	2.8	**0.2**	1.0	**-0.1**	3.6	**-1.4**	1.5	**-0.5**	1.2	**-1.5**	1.3		
VSL	**0.5**	0.9	**1.6**	1.1	**0.4**	2.8	**0.9**	1.0	**0.6**	3.6	**-0.8**	1.5	**0.2**	1.2	**-0.8**	1.3	**0.7**	1.3
NPL	**0.1**	0.3	**1.2**	0.7	**0.0**	2.6	**0.6**	0.5	**0.2**	3.5	**-1.1**	1.2	**-0.2**	0.9	**-1.2**	1.0	**0.3**	1.0
NRC	**0.1**	0.2	**1.2**	0.6	**0.0**	2.6	**0.5**	0.4	**0.2**	3.5	**-1.2**	1.2	**-0.2**	0.8	**-1.2**	0.9	**0.3**	1.0
MKEH	**-0.2**	2.8	**0.9**	2.8	**-0.3**	3.8	**0.3**	2.8	**-0.1**	4.4	**-1.4**	3.0	**-0.5**	2.9	**-1.5**	2.9	**0.0**	2.9
PTB	**0.1**	0.3	**1.2**	0.6	**0.0**	2.6	**0.5**	0.4	**0.2**	3.5	**-1.2**	1.2	**-0.2**	0.9	**-1.2**	0.9	**0.3**	1.0
SMU	**0.4**	0.4	**1.5**	0.7	**0.3**	2.6	**0.8**	0.5	**0.5**	3.5	**-0.9**	1.3	**0.1**	0.9	**-0.9**	1.0	**0.6**	1.0
VNIIOFI	**-0.8**	1.1	**0.3**	1.2	**-0.9**	2.8	**-0.4**	1.1	**-0.7**	3.6	**-2.1**	1.6	**-1.1**	1.3	**-2.1**	1.4	**-0.6**	1.4

Key comparison CCPR-K2.a

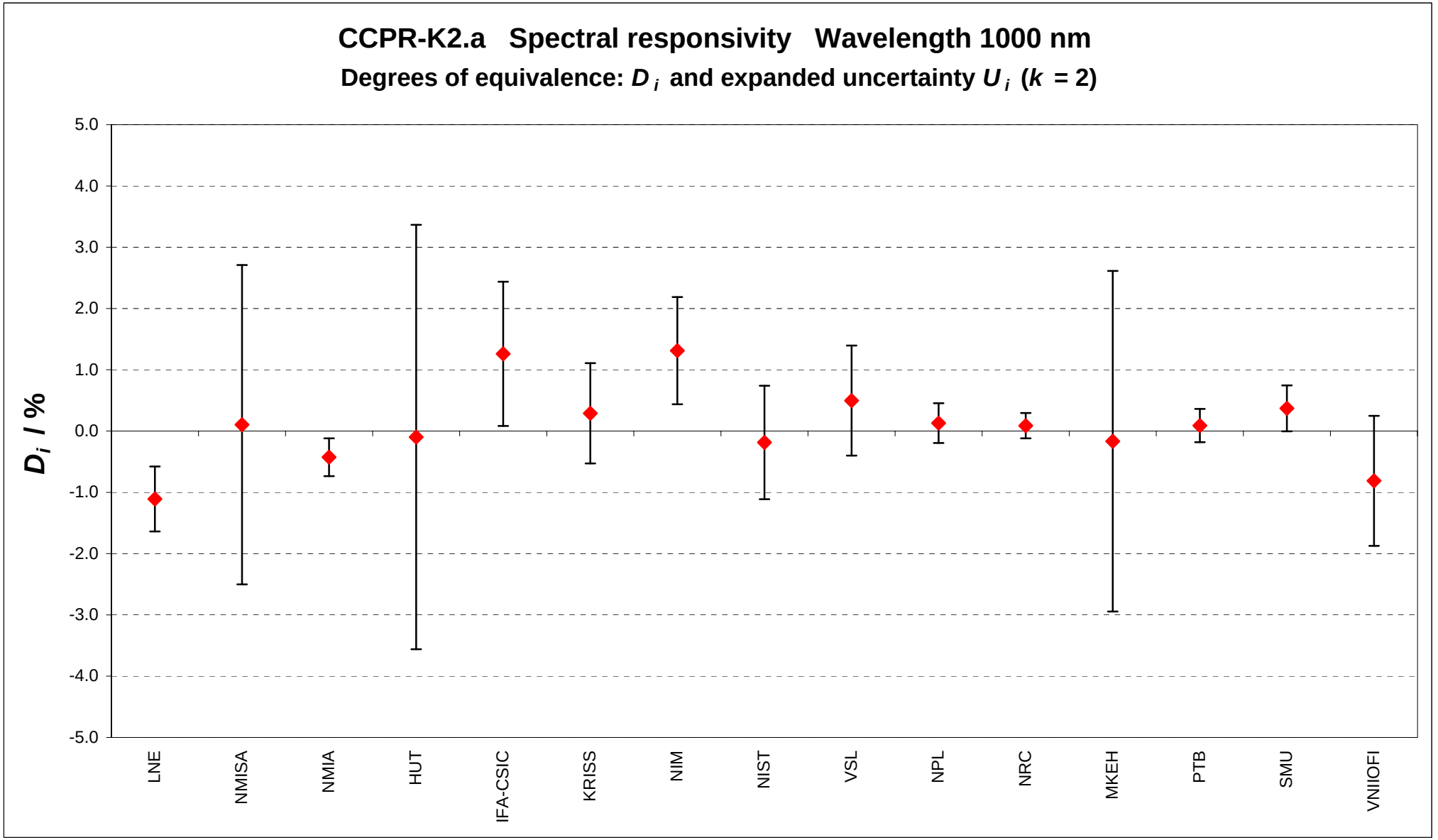
Wavelength : 1000 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.1**	0.5	**-1.6**	1.1	**-1.2**	0.7	**-1.2**	0.6	**-0.9**	2.8	**-1.2**	0.6	**-1.5**	0.7	**-0.3**	1.2
NMISA	**0.1**	2.6	**-0.4**	2.8	**0.0**	2.6	**0.0**	2.6	**0.3**	3.8	**0.0**	2.6	**-0.3**	2.6	**0.9**	2.8
NMIA	**-0.4**	0.3	**-0.9**	1.0	**-0.6**	0.5	**-0.5**	0.4	**-0.3**	2.8	**-0.5**	0.4	**-0.8**	0.5	**0.4**	1.1
HUT	**-0.1**	3.5	**-0.6**	3.6	**-0.2**	3.5	**-0.2**	3.5	**0.1**	4.4	**-0.2**	3.5	**-0.5**	3.5	**0.7**	3.6
IFA-CSIC	**1.3**	1.2	**0.8**	1.5	**1.1**	1.2	**1.2**	1.2	**1.4**	3.0	**1.2**	1.2	**0.9**	1.3	**2.1**	1.6
KRISS	**0.3**	0.8	**-0.2**	1.2	**0.2**	0.9	**0.2**	0.8	**0.5**	2.9	**0.2**	0.9	**-0.1**	0.9	**1.1**	1.3
NIM	**1.3**	0.9	**0.8**	1.3	**1.2**	1.0	**1.2**	0.9	**1.5**	2.9	**1.2**	0.9	**0.9**	1.0	**2.1**	1.4
NIST	**-0.2**	0.9	**-0.7**	1.3	**-0.3**	1.0	**-0.3**	1.0	**0.0**	2.9	**-0.3**	1.0	**-0.6**	1.0	**0.6**	1.4
VSL	**0.5**	0.9			**0.4**	1.0	**0.4**	0.9	**0.7**	2.9	**0.4**	1.0	**0.1**	1.0	**1.3**	1.4
NPL	**0.1**	0.3	**-0.4**	1.0			**0.0**	0.4	**0.3**	2.8	**0.0**	0.5	**-0.2**	0.5	**0.9**	1.1
NRC	**0.1**	0.2	**-0.4**	0.9	**0.0**	0.4			**0.3**	2.8	**0.0**	0.3	**-0.3**	0.5	**0.9**	1.1
MKEH	**-0.2**	2.8	**-0.7**	2.9	**-0.3**	2.8	**-0.3**	2.8			**-0.3**	2.8	**-0.5**	2.8	**0.6**	3.0
PTB	**0.1**	0.3	**-0.4**	1.0	**0.0**	0.5	**0.0**	0.3	**0.3**	2.8			**-0.3**	0.5	**0.9**	1.1
SMU	**0.4**	0.4	**-0.1**	1.0	**0.2**	0.5	**0.3**	0.5	**0.5**	2.8	**0.3**	0.5			**1.2**	1.2
VNIIOFI	**-0.8**	1.1	**-1.3**	1.4	**-0.9**	1.1	**-0.9**	1.1	**-0.6**	3.0	**-0.9**	1.1	**-1.2**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1000 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1050 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.1**	0.5			**-1.3**	2.3	**-0.7**	0.7	**-1.6**	3.6	**-2.5**	1.3	**-1.1**	1.2	**-1.9**	1.0	**-1.3**	1.0
NMISA	**0.2**	2.2	**1.3**	2.3			**0.6**	2.2	**-0.3**	4.2	**-1.2**	2.5	**0.2**	2.4	**-0.6**	2.4	**0.0**	2.4
NMIA	**-0.3**	0.3	**0.7**	0.7	**-0.6**	2.2			**-0.8**	3.6	**-1.8**	1.3	**-0.3**	1.1	**-1.1**	0.9	**-0.5**	1.0
HUT	**0.5**	3.5	**1.6**	3.6	**0.3**	4.2	**0.8**	3.6			**-1.0**	3.7	**0.5**	3.7	**-0.3**	3.6	**0.3**	3.6
IFA-CSIC	**1.5**	1.2	**2.5**	1.3	**1.2**	2.5	**1.8**	1.3	**1.0**	3.7			**1.5**	1.6	**0.7**	1.5	**1.3**	1.5
KRISS	**0.0**	1.0	**1.1**	1.2	**-0.2**	2.4	**0.3**	1.1	**-0.5**	3.7	**-1.5**	1.6			**-0.8**	1.3	**-0.2**	1.3
NIM	**0.8**	0.8	**1.9**	1.0	**0.6**	2.4	**1.1**	0.9	**0.3**	3.6	**-0.7**	1.5	**0.8**	1.3			**0.6**	1.2
NIST	**0.2**	0.9	**1.3**	1.0	**0.0**	2.4	**0.5**	1.0	**-0.3**	3.6	**-1.3**	1.5	**0.2**	1.3	**-0.6**	1.2		
VSL	**0.3**	0.8	**1.4**	1.0	**0.1**	2.3	**0.6**	0.9	**-0.2**	3.6	**-1.2**	1.4	**0.3**	1.3	**-0.5**	1.2	**0.1**	1.2
NPL	**0.1**	0.3	**1.2**	0.7	**-0.1**	2.2	**0.5**	0.5	**-0.4**	3.5	**-1.3**	1.2	**0.1**	1.1	**-0.7**	0.9	**-0.1**	0.9
NRC	**0.1**	0.2	**1.1**	0.6	**-0.2**	2.2	**0.4**	0.4	**-0.5**	3.5	**-1.4**	1.2	**0.1**	1.0	**-0.7**	0.9	**-0.1**	0.9
MKEH	**0.6**	3.5	**1.6**	3.6	**0.3**	4.2	**0.9**	3.6	**0.0**	5.0	**-0.9**	3.7	**0.6**	3.7	**-0.2**	3.6	**0.3**	3.6
PTB	**0.1**	0.3	**1.1**	0.6	**-0.2**	2.2	**0.4**	0.5	**-0.4**	3.5	**-1.4**	1.2	**0.1**	1.0	**-0.7**	0.9	**-0.1**	0.9
SMU	**0.2**	0.4	**1.3**	0.7	**0.0**	2.2	**0.5**	0.5	**-0.3**	3.6	**-1.3**	1.3	**0.2**	1.1	**-0.6**	0.9	**0.0**	1.0
VNIIOFI	**-0.9**	1.3	**0.2**	1.4	**-1.1**	2.6	**-0.6**	1.3	**-1.4**	3.8	**-2.3**	1.8	**-0.9**	1.6	**-1.7**	1.5	**-1.1**	1.6

Key comparison CCPR-K2.a

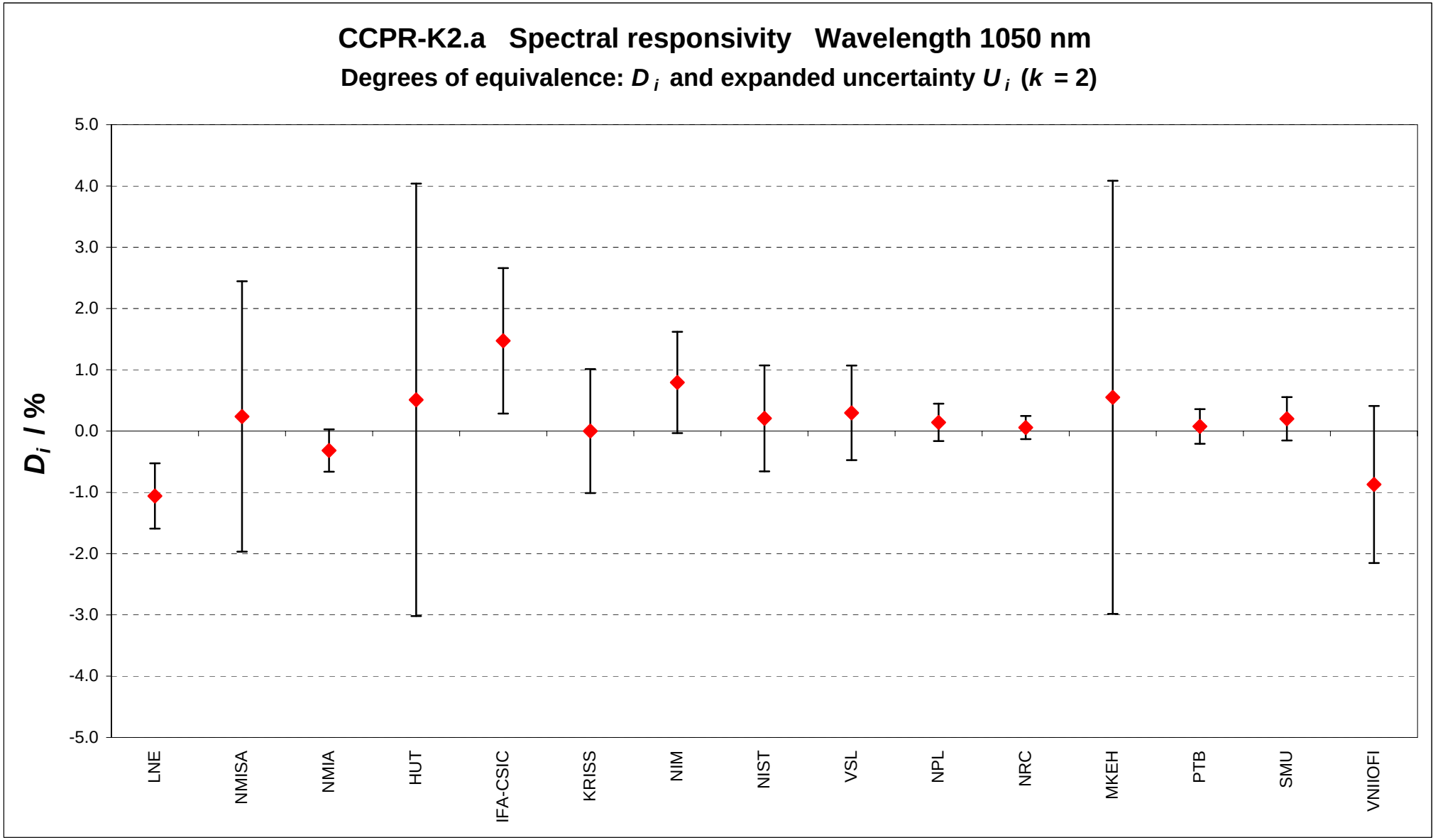
Wavelength : 1050 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.1**	0.5	**-1.4**	1.0	**-1.2**	0.7	**-1.1**	0.6	**-1.6**	3.6	**-1.1**	0.6	**-1.3**	0.7	**-0.2**	1.4
NMISA	**0.2**	2.2	**-0.1**	2.3	**0.1**	2.2	**0.2**	2.2	**-0.3**	4.2	**0.2**	2.2	**0.0**	2.2	**1.1**	2.6
NMIA	**-0.3**	0.3	**-0.6**	0.9	**-0.5**	0.5	**-0.4**	0.4	**-0.9**	3.6	**-0.4**	0.5	**-0.5**	0.5	**0.6**	1.3
HUT	**0.5**	3.5	**0.2**	3.6	**0.4**	3.5	**0.5**	3.5	**0.0**	5.0	**0.4**	3.5	**0.3**	3.6	**1.4**	3.8
IFA-CSIC	**1.5**	1.2	**1.2**	1.4	**1.3**	1.2	**1.4**	1.2	**0.9**	3.7	**1.4**	1.2	**1.3**	1.3	**2.3**	1.8
KRISS	**0.0**	1.0	**-0.3**	1.3	**-0.1**	1.1	**-0.1**	1.0	**-0.6**	3.7	**-0.1**	1.0	**-0.2**	1.1	**0.9**	1.6
NIM	**0.8**	0.8	**0.5**	1.2	**0.7**	0.9	**0.7**	0.9	**0.2**	3.6	**0.7**	0.9	**0.6**	0.9	**1.7**	1.5
NIST	**0.2**	0.9	**-0.1**	1.2	**0.1**	0.9	**0.1**	0.9	**-0.3**	3.6	**0.1**	0.9	**0.0**	1.0	**1.1**	1.6
VSL	**0.3**	0.8			**0.2**	0.9	**0.2**	0.8	**-0.3**	3.6	**0.2**	0.8	**0.1**	0.9	**1.2**	1.5
NPL	**0.1**	0.3	**-0.2**	0.9			**0.1**	0.4	**-0.4**	3.6	**0.1**	0.4	**-0.1**	0.5	**1.0**	1.3
NRC	**0.1**	0.2	**-0.2**	0.8	**-0.1**	0.4			**-0.5**	3.5	**0.0**	0.3	**-0.1**	0.4	**0.9**	1.3
MKEH	**0.6**	3.5	**0.3**	3.6	**0.4**	3.6	**0.5**	3.5			**0.5**	3.6	**0.4**	3.6	**1.4**	3.8
PTB	**0.1**	0.3	**-0.2**	0.8	**-0.1**	0.4	**0.0**	0.3	**-0.5**	3.6			**-0.1**	0.5	**0.9**	1.3
SMU	**0.2**	0.4	**-0.1**	0.9	**0.1**	0.5	**0.1**	0.4	**-0.4**	3.6	**0.1**	0.5			**1.1**	1.4
VNIIOFI	**-0.9**	1.3	**-1.2**	1.5	**-1.0**	1.3	**-0.9**	1.3	**-1.4**	3.8	**-0.9**	1.3	**-1.1**	1.4		


CCPR-K2.a Spectral responsivity Wavelength 1050 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1100 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.0**	0.5			**-0.9**	2.3	**-0.7**	0.6	**-0.9**	3.5	**-2.6**	1.3	**-1.1**	1.1	**-1.3**	1.1	**-1.0**	0.7
NMISA	**-0.1**	2.2	**0.9**	2.3			**0.2**	2.2	**0.0**	4.1	**-1.6**	2.5	**-0.2**	2.4	**-0.4**	2.4	**-0.1**	2.3
NMIA	**-0.3**	0.3	**0.7**	0.6	**-0.2**	2.2			**-0.2**	3.5	**-1.8**	1.2	**-0.3**	1.1	**-0.5**	1.0	**-0.3**	0.6
HUT	**-0.1**	3.5	**0.9**	3.5	**0.0**	4.1	**0.2**	3.5			**-1.6**	3.7	**-0.1**	3.6	**-0.3**	3.6	**-0.1**	3.5
IFA-CSIC	**1.5**	1.2	**2.6**	1.3	**1.6**	2.5	**1.8**	1.2	**1.6**	3.7			**1.5**	1.6	**1.3**	1.5	**1.5**	1.3
KRISS	**0.1**	1.0	**1.1**	1.1	**0.2**	2.4	**0.3**	1.1	**0.1**	3.6	**-1.5**	1.6			**-0.2**	1.4	**0.1**	1.1
NIM	**0.3**	0.9	**1.3**	1.1	**0.4**	2.4	**0.5**	1.0	**0.3**	3.6	**-1.3**	1.5	**0.2**	1.4			**0.2**	1.0
NIST	**0.0**	0.5	**1.0**	0.7	**0.1**	2.3	**0.3**	0.6	**0.1**	3.5	**-1.5**	1.3	**-0.1**	1.1	**-0.2**	1.0		
VSL	**0.3**	0.6	**1.3**	0.8	**0.3**	2.3	**0.5**	0.7	**0.3**	3.5	**-1.3**	1.3	**0.2**	1.2	**0.0**	1.1	**0.2**	0.8
NPL	**0.2**	0.3	**1.2**	0.6	**0.3**	2.2	**0.5**	0.5	**0.3**	3.5	**-1.3**	1.2	**0.1**	1.1	**-0.1**	1.0	**0.2**	0.6
NRC	**0.0**	0.2	**1.0**	0.6	**0.1**	2.2	**0.2**	0.4	**0.0**	3.5	**-1.6**	1.2	**-0.1**	1.0	**-0.3**	0.9	**0.0**	0.5
MKEH	**0.8**	3.3	**1.8**	3.4	**0.9**	4.0	**1.1**	3.4	**0.9**	4.8	**-0.7**	3.5	**0.7**	3.5	**0.5**	3.5	**0.8**	3.4
PTB	**0.1**	0.3	**1.1**	0.6	**0.2**	2.2	**0.4**	0.4	**0.2**	3.5	**-1.4**	1.2	**0.1**	1.0	**-0.1**	0.9	**0.1**	0.6
SMU	**0.2**	0.4	**1.2**	0.7	**0.3**	2.2	**0.5**	0.5	**0.3**	3.5	**-1.3**	1.2	**0.1**	1.1	**-0.1**	1.0	**0.2**	0.6
VNIIOFI	**-1.2**	1.1	**-0.2**	1.3	**-1.1**	2.5	**-1.0**	1.2	**-1.2**	3.6	**-2.8**	1.6	**-1.3**	1.5	**-1.5**	1.4	**-1.2**	1.2

Key comparison CCPR-K2.a

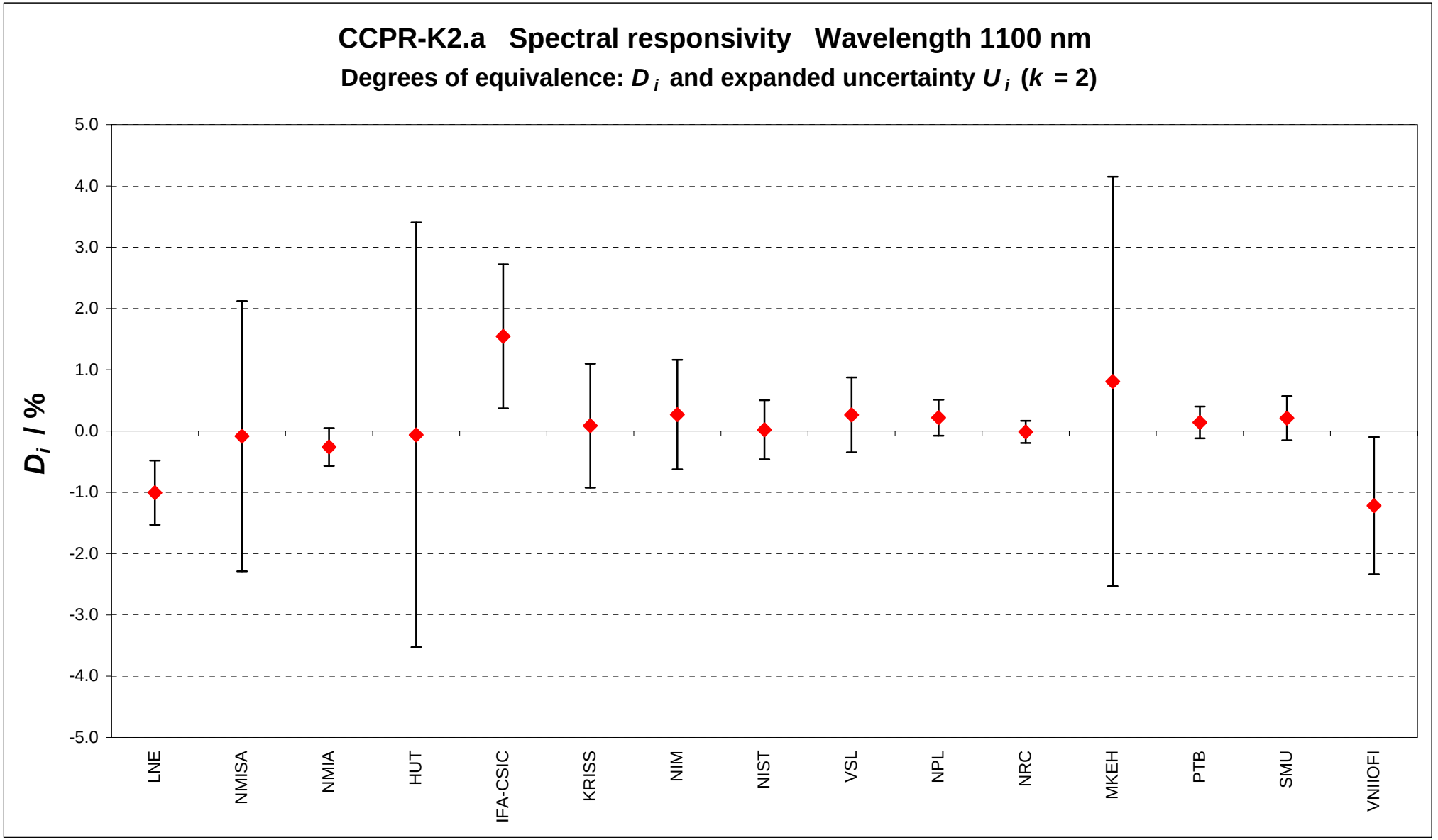
Wavelength : 1100 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.0**	0.5	**-1.3**	0.8	**-1.2**	0.6	**-1.0**	0.6	**-1.8**	3.4	**-1.1**	0.6	**-1.2**	0.7	**0.2**	1.3
NMISA	**-0.1**	2.2	**-0.3**	2.3	**-0.3**	2.2	**-0.1**	2.2	**-0.9**	4.0	**-0.2**	2.2	**-0.3**	2.2	**1.1**	2.5
NMIA	**-0.3**	0.3	**-0.5**	0.7	**-0.5**	0.5	**-0.2**	0.4	**-1.1**	3.4	**-0.4**	0.4	**-0.5**	0.5	**1.0**	1.2
HUT	**-0.1**	3.5	**-0.3**	3.5	**-0.3**	3.5	**0.0**	3.5	**-0.9**	4.8	**-0.2**	3.5	**-0.3**	3.5	**1.2**	3.6
IFA-CSIC	**1.5**	1.2	**1.3**	1.3	**1.3**	1.2	**1.6**	1.2	**0.7**	3.5	**1.4**	1.2	**1.3**	1.2	**2.8**	1.6
KRISS	**0.1**	1.0	**-0.2**	1.2	**-0.1**	1.1	**0.1**	1.0	**-0.7**	3.5	**-0.1**	1.0	**-0.1**	1.1	**1.3**	1.5
NIM	**0.3**	0.9	**0.0**	1.1	**0.1**	1.0	**0.3**	0.9	**-0.5**	3.5	**0.1**	0.9	**0.1**	1.0	**1.5**	1.4
NIST	**0.0**	0.5	**-0.2**	0.8	**-0.2**	0.6	**0.0**	0.5	**-0.8**	3.4	**-0.1**	0.6	**-0.2**	0.6	**1.2**	1.2
VSL	**0.3**	0.6			**0.0**	0.7	**0.3**	0.7	**-0.5**	3.4	**0.1**	0.7	**0.1**	0.7	**1.5**	1.3
NPL	**0.2**	0.3	**0.0**	0.7			**0.2**	0.4	**-0.6**	3.4	**0.1**	0.4	**0.0**	0.5	**1.4**	1.2
NRC	**0.0**	0.2	**-0.3**	0.7	**-0.2**	0.4			**-0.8**	3.3	**-0.2**	0.3	**-0.2**	0.4	**1.2**	1.1
MKEH	**0.8**	3.3	**0.5**	3.4	**0.6**	3.4	**0.8**	3.3			**0.7**	3.4	**0.6**	3.4	**2.0**	3.5
PTB	**0.1**	0.3	**-0.1**	0.7	**-0.1**	0.4	**0.2**	0.3	**-0.7**	3.4			**-0.1**	0.5	**1.4**	1.2
SMU	**0.2**	0.4	**-0.1**	0.7	**0.0**	0.5	**0.2**	0.4	**-0.6**	3.4	**0.1**	0.5			**1.4**	1.2
VNIIOFI	**-1.2**	1.1	**-1.5**	1.3	**-1.4**	1.2	**-1.2**	1.1	**-2.0**	3.5	**-1.4**	1.2	**-1.4**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1100 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1150 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.0**	0.5			**-1.2**	2.3	**-0.8**	0.6	**-1.2**	3.5	**-2.4**	1.3	**-1.1**	1.1	**-0.9**	1.0	**-1.1**	1.0
NMISA	**0.3**	2.2	**1.2**	2.3			**0.4**	2.2	**0.0**	4.1	**-1.1**	2.5	**0.1**	2.4	**0.3**	2.3	**0.2**	2.4
NMIA	**-0.1**	0.3	**0.8**	0.6	**-0.4**	2.2			**-0.4**	3.5	**-1.5**	1.2	**-0.3**	1.0	**-0.1**	0.9	**-0.2**	0.9
HUT	**0.2**	3.5	**1.2**	3.5	**0.0**	4.1	**0.4**	3.5			**-1.2**	3.7	**0.1**	3.6	**0.3**	3.6	**0.1**	3.6
IFA-CSIC	**1.4**	1.2	**2.4**	1.3	**1.1**	2.5	**1.5**	1.2	**1.2**	3.7			**1.3**	1.5	**1.4**	1.4	**1.3**	1.4
KRISS	**0.1**	1.0	**1.1**	1.1	**-0.1**	2.4	**0.3**	1.0	**-0.1**	3.6	**-1.3**	1.5			**0.2**	1.3	**0.0**	1.3
NIM	**0.0**	0.8	**0.9**	1.0	**-0.3**	2.3	**0.1**	0.9	**-0.3**	3.6	**-1.4**	1.4	**-0.2**	1.3			**-0.1**	1.2
NIST	**0.1**	0.8	**1.1**	1.0	**-0.2**	2.4	**0.2**	0.9	**-0.1**	3.6	**-1.3**	1.4	**0.0**	1.3	**0.1**	1.2		
VSL	**0.2**	0.5	**1.1**	0.8	**-0.1**	2.3	**0.3**	0.6	**0.0**	3.5	**-1.2**	1.3	**0.1**	1.1	**0.2**	1.0	**0.1**	1.0
NPL	**0.2**	0.3	**1.1**	0.6	**-0.1**	2.2	**0.3**	0.4	**0.0**	3.5	**-1.2**	1.2	**0.0**	1.1	**0.2**	0.9	**0.1**	0.9
NRC	**0.0**	0.2	**0.9**	0.6	**-0.3**	2.2	**0.1**	0.3	**-0.2**	3.5	**-1.4**	1.2	**-0.1**	1.0	**0.0**	0.8	**-0.1**	0.8
MKEH	**0.7**	3.5	**1.6**	3.6	**0.4**	4.1	**0.8**	3.5	**0.4**	4.9	**-0.8**	3.7	**0.5**	3.7	**0.7**	3.6	**0.6**	3.6
PTB	**0.2**	0.2	**1.1**	0.6	**-0.1**	2.2	**0.3**	0.4	**0.0**	3.5	**-1.2**	1.2	**0.1**	1.0	**0.2**	0.9	**0.1**	0.9
SMU	**0.2**	0.4	**1.2**	0.7	**-0.1**	2.2	**0.3**	0.5	**0.0**	3.5	**-1.2**	1.2	**0.1**	1.1	**0.2**	0.9	**0.1**	0.9
VNIIOFI	**-1.5**	1.1	**-0.6**	1.2	**-1.8**	2.5	**-1.4**	1.2	**-1.7**	3.6	**-2.9**	1.6	**-1.6**	1.5	**-1.5**	1.4	**-1.6**	1.4

Key comparison CCPR-K2.a

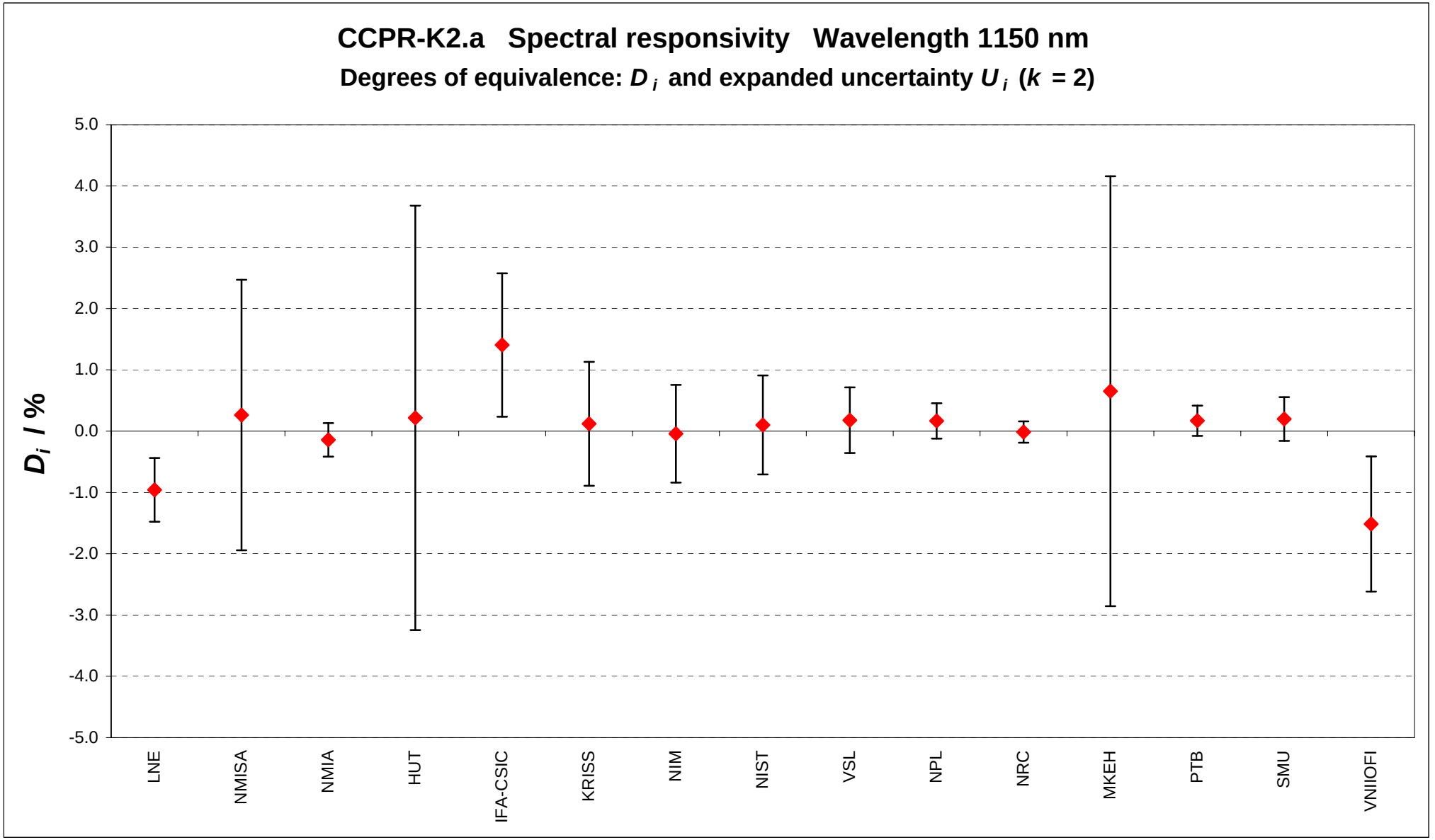
Wavelength : 1150 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-1.0**	0.5	**-1.1**	0.8	**-1.1**	0.6	**-0.9**	0.6	**-1.6**	3.6	**-1.1**	0.6	**-1.2**	0.7	**0.6**	1.2
NMISA	**0.3**	2.2	**0.1**	2.3	**0.1**	2.2	**0.3**	2.2	**-0.4**	4.1	**0.1**	2.2	**0.1**	2.2	**1.8**	2.5
NMIA	**-0.1**	0.3	**-0.3**	0.6	**-0.3**	0.4	**-0.1**	0.3	**-0.8**	3.5	**-0.3**	0.4	**-0.3**	0.5	**1.4**	1.2
HUT	**0.2**	3.5	**0.0**	3.5	**0.0**	3.5	**0.2**	3.5	**-0.4**	4.9	**0.0**	3.5	**0.0**	3.5	**1.7**	3.6
IFA-CSIC	**1.4**	1.2	**1.2**	1.3	**1.2**	1.2	**1.4**	1.2	**0.8**	3.7	**1.2**	1.2	**1.2**	1.2	**2.9**	1.6
KRISS	**0.1**	1.0	**-0.1**	1.1	**0.0**	1.1	**0.1**	1.0	**-0.5**	3.7	**-0.1**	1.0	**-0.1**	1.1	**1.6**	1.5
NIM	**0.0**	0.8	**-0.2**	1.0	**-0.2**	0.9	**0.0**	0.8	**-0.7**	3.6	**-0.2**	0.9	**-0.2**	0.9	**1.5**	1.4
NIST	**0.1**	0.8	**-0.1**	1.0	**-0.1**	0.9	**0.1**	0.8	**-0.6**	3.6	**-0.1**	0.9	**-0.1**	0.9	**1.6**	1.4
VSL	**0.2**	0.5			**0.0**	0.6	**0.2**	0.6	**-0.5**	3.6	**0.0**	0.6	**0.0**	0.7	**1.7**	1.2
NPL	**0.2**	0.3	**0.0**	0.6			**0.2**	0.4	**-0.5**	3.5	**0.0**	0.4	**0.0**	0.5	**1.7**	1.2
NRC	**0.0**	0.2	**-0.2**	0.6	**-0.2**	0.4			**-0.7**	3.5	**-0.2**	0.3	**-0.2**	0.4	**1.5**	1.1
MKEH	**0.7**	3.5	**0.5**	3.6	**0.5**	3.5	**0.7**	3.5			**0.5**	3.5	**0.5**	3.5	**2.2**	3.7
PTB	**0.2**	0.2	**0.0**	0.6	**0.0**	0.4	**0.2**	0.3	**-0.5**	3.5			**0.0**	0.5	**1.7**	1.1
SMU	**0.2**	0.4	**0.0**	0.7	**0.0**	0.5	**0.2**	0.4	**-0.5**	3.5	**0.0**	0.5			**1.7**	1.2
VNIIOFI	**-1.5**	1.1	**-1.7**	1.2	**-1.7**	1.2	**-1.5**	1.1	**-2.2**	3.7	**-1.7**	1.1	**-1.7**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1150 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1200 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5			**-0.7**	2.3	**-0.4**	0.6	**-1.1**	3.5	**-2.3**	1.3	**-0.8**	1.2	**-0.4**	1.1	**-0.6**	1.6
NMISA	**0.0**	2.2	**0.7**	2.3			**0.3**	2.2	**-0.4**	4.1	**-1.6**	2.5	**-0.1**	2.4	**0.3**	2.4	**0.0**	2.7
NMIA	**-0.3**	0.2	**0.4**	0.6	**-0.3**	2.2			**-0.7**	3.5	**-1.9**	1.2	**-0.4**	1.0	**0.0**	0.9	**-0.2**	1.5
HUT	**0.4**	3.5	**1.1**	3.5	**0.4**	4.1	**0.7**	3.5			**-1.3**	3.7	**0.3**	3.6	**0.7**	3.6	**0.4**	3.8
IFA-CSIC	**1.6**	1.2	**2.3**	1.3	**1.6**	2.5	**1.9**	1.2	**1.3**	3.7			**1.5**	1.6	**1.9**	1.5	**1.7**	1.9
KRISS	**0.1**	1.0	**0.8**	1.2	**0.1**	2.4	**0.4**	1.0	**-0.3**	3.6	**-1.5**	1.6			**0.4**	1.3	**0.1**	1.8
NIM	**-0.3**	0.9	**0.4**	1.1	**-0.3**	2.4	**0.0**	0.9	**-0.7**	3.6	**-1.9**	1.5	**-0.4**	1.3			**-0.2**	1.8
NIST	**0.0**	1.5	**0.6**	1.6	**0.0**	2.7	**0.2**	1.5	**-0.4**	3.8	**-1.7**	1.9	**-0.1**	1.8	**0.2**	1.8		
VSL	**0.1**	0.5	**0.8**	0.8	**0.1**	2.3	**0.4**	0.6	**-0.3**	3.5	**-1.5**	1.3	**0.0**	1.1	**0.4**	1.0	**0.2**	1.6
NPL	**0.3**	0.3	**1.0**	0.7	**0.3**	2.2	**0.6**	0.5	**-0.1**	3.5	**-1.3**	1.2	**0.2**	1.1	**0.6**	1.0	**0.3**	1.6
NRC	**-0.1**	0.2	**0.6**	0.6	**-0.1**	2.2	**0.2**	0.3	**-0.5**	3.5	**-1.7**	1.2	**-0.2**	1.0	**0.2**	0.9	**-0.1**	1.5
MKEH	**0.7**	3.4	**1.4**	3.5	**0.7**	4.1	**1.0**	3.5	**0.3**	4.9	**-0.9**	3.6	**0.6**	3.6	**1.0**	3.6	**0.7**	3.8
PTB	**0.2**	0.2	**0.9**	0.6	**0.2**	2.2	**0.5**	0.4	**-0.2**	3.5	**-1.4**	1.2	**0.1**	1.0	**0.5**	0.9	**0.3**	1.5
SMU	**0.2**	0.4	**0.8**	0.7	**0.2**	2.2	**0.4**	0.5	**-0.2**	3.5	**-1.5**	1.3	**0.1**	1.1	**0.5**	1.0	**0.2**	1.6
VNIIOFI	**-1.9**	1.1	**-1.2**	1.2	**-1.9**	2.5	**-1.6**	1.1	**-2.3**	3.6	**-3.5**	1.6	**-2.0**	1.5	**-1.6**	1.4	**-1.8**	1.9

Key comparison CCPR-K2.a

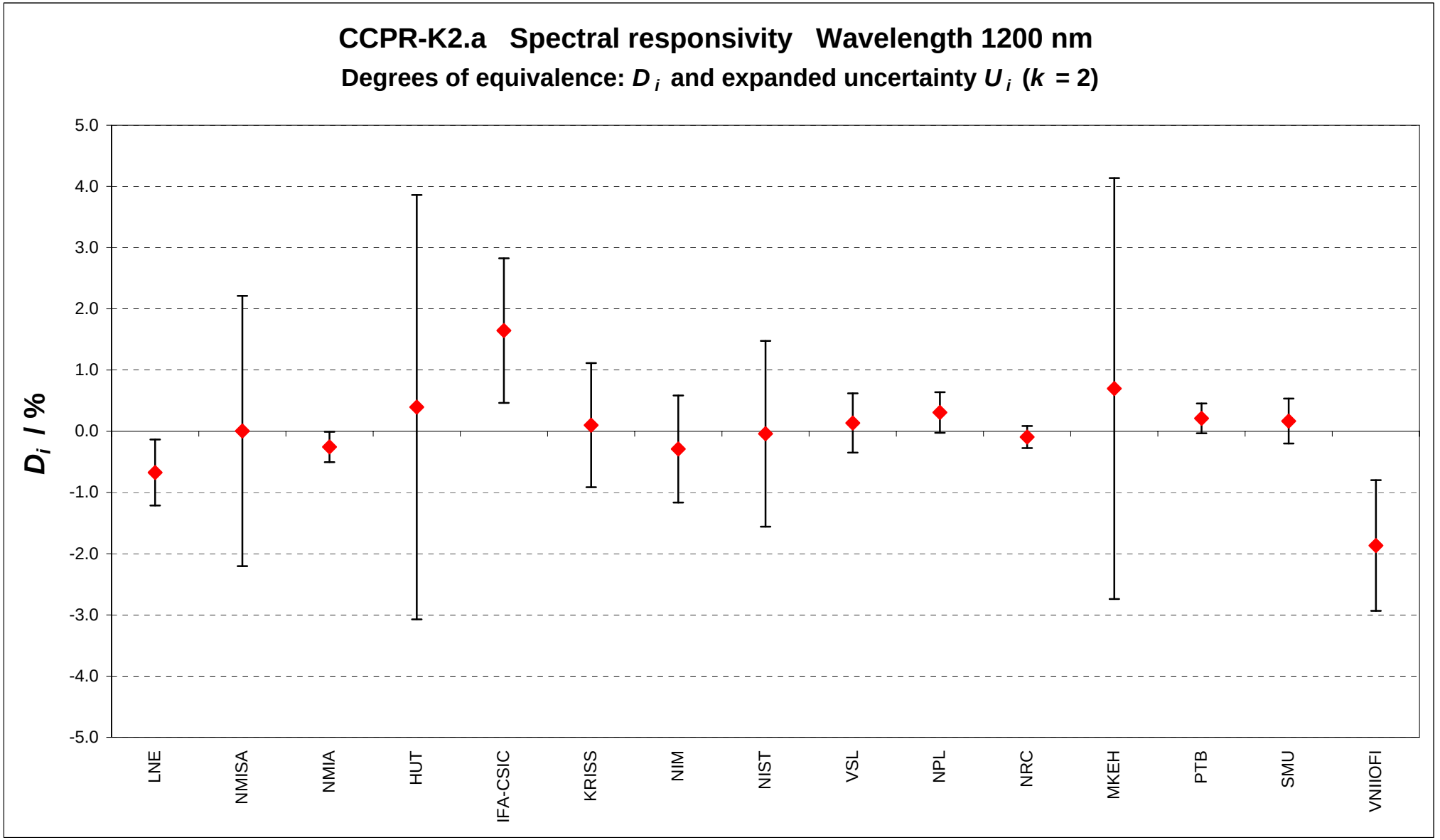
Wavelength : 1200 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5	**-0.8**	0.8	**-1.0**	0.7	**-0.6**	0.6	**-1.4**	3.5	**-0.9**	0.6	**-0.8**	0.7	**1.2**	1.2
NMISA	**0.0**	2.2	**-0.1**	2.3	**-0.3**	2.2	**0.1**	2.2	**-0.7**	4.1	**-0.2**	2.2	**-0.2**	2.2	**1.9**	2.5
NMIA	**-0.3**	0.2	**-0.4**	0.6	**-0.6**	0.5	**-0.2**	0.3	**-1.0**	3.5	**-0.5**	0.4	**-0.4**	0.5	**1.6**	1.1
HUT	**0.4**	3.5	**0.3**	3.5	**0.1**	3.5	**0.5**	3.5	**-0.3**	4.9	**0.2**	3.5	**0.2**	3.5	**2.3**	3.6
IFA-CSIC	**1.6**	1.2	**1.5**	1.3	**1.3**	1.2	**1.7**	1.2	**0.9**	3.6	**1.4**	1.2	**1.5**	1.3	**3.5**	1.6
KRISS	**0.1**	1.0	**0.0**	1.1	**-0.2**	1.1	**0.2**	1.0	**-0.6**	3.6	**-0.1**	1.0	**-0.1**	1.1	**2.0**	1.5
NIM	**-0.3**	0.9	**-0.4**	1.0	**-0.6**	1.0	**-0.2**	0.9	**-1.0**	3.6	**-0.5**	0.9	**-0.5**	1.0	**1.6**	1.4
NIST	**0.0**	1.5	**-0.2**	1.6	**-0.3**	1.6	**0.1**	1.5	**-0.7**	3.8	**-0.3**	1.5	**-0.2**	1.6	**1.8**	1.9
VSL	**0.1**	0.5			**-0.2**	0.6	**0.2**	0.5	**-0.6**	3.5	**-0.1**	0.6	**0.0**	0.6	**2.0**	1.2
NPL	**0.3**	0.3	**0.2**	0.6			**0.4**	0.4	**-0.4**	3.5	**0.1**	0.5	**0.1**	0.5	**2.2**	1.1
NRC	**-0.1**	0.2	**-0.2**	0.5	**-0.4**	0.4			**-0.8**	3.4	**-0.3**	0.3	**-0.3**	0.4	**1.8**	1.1
MKEH	**0.7**	3.4	**0.6**	3.5	**0.4**	3.5	**0.8**	3.4			**0.5**	3.5	**0.5**	3.5	**2.6**	3.6
PTB	**0.2**	0.2	**0.1**	0.6	**-0.1**	0.5	**0.3**	0.3	**-0.5**	3.5			**0.0**	0.5	**2.1**	1.1
SMU	**0.2**	0.4	**0.0**	0.6	**-0.1**	0.5	**0.3**	0.4	**-0.5**	3.5	**0.0**	0.5			**2.0**	1.2
VNIIOFI	**-1.9**	1.1	**-2.0**	1.2	**-2.2**	1.1	**-1.8**	1.1	**-2.6**	3.6	**-2.1**	1.1	**-2.0**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1200 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1250 nm

Matrix of equivalence (1/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5			**-0.9**	2.1	**-0.4**	0.6	**-0.8**	3.5	**-2.3**	1.3	**-0.8**	1.1	**-0.4**	1.0	**-0.9**	1.1
NMISA	**0.1**	2.0	**0.9**	2.1			**0.5**	2.0	**0.1**	4.0	**-1.4**	2.3	**0.1**	2.2	**0.5**	2.2	**0.0**	2.2
NMIA	**-0.4**	0.2	**0.4**	0.6	**-0.5**	2.0			**-0.4**	3.5	**-1.9**	1.2	**-0.4**	1.0	**0.0**	0.9	**-0.5**	0.9
HUT	**0.0**	3.5	**0.8**	3.5	**-0.1**	4.0	**0.4**	3.5			**-1.5**	3.7	**0.0**	3.6	**0.4**	3.6	**-0.1**	3.6
IFA-CSIC	**1.5**	1.2	**2.3**	1.3	**1.4**	2.3	**1.9**	1.2	**1.5**	3.7			**1.5**	1.6	**1.9**	1.5	**1.4**	1.5
KRISS	**0.0**	1.0	**0.8**	1.1	**-0.1**	2.2	**0.4**	1.0	**0.0**	3.6	**-1.5**	1.6			**0.4**	1.3	**-0.1**	1.4
NIM	**-0.4**	0.8	**0.4**	1.0	**-0.5**	2.2	**0.0**	0.9	**-0.4**	3.6	**-1.9**	1.5	**-0.4**	1.3			**-0.5**	1.2
NIST	**0.1**	0.9	**0.9**	1.1	**0.0**	2.2	**0.5**	0.9	**0.1**	3.6	**-1.4**	1.5	**0.1**	1.4	**0.5**	1.2		
VSL	**0.2**	0.4	**1.0**	0.7	**0.1**	2.0	**0.6**	0.5	**0.2**	3.5	**-1.3**	1.3	**0.2**	1.1	**0.6**	0.9	**0.1**	1.0
NPL	**0.2**	0.3	**1.0**	0.6	**0.1**	2.0	**0.6**	0.4	**0.2**	3.5	**-1.3**	1.2	**0.2**	1.1	**0.6**	0.9	**0.1**	1.0
NRC	**0.0**	0.2	**0.8**	0.6	**-0.1**	2.0	**0.4**	0.2	**0.0**	3.5	**-1.5**	1.2	**0.0**	1.0	**0.4**	0.8	**-0.1**	0.9
MKEH	**0.3**	3.4	**1.1**	3.4	**0.2**	3.9	**0.7**	3.4	**0.3**	4.8	**-1.3**	3.6	**0.3**	3.5	**0.6**	3.5	**0.2**	3.5
PTB	**0.3**	0.2	**1.0**	0.6	**0.1**	2.0	**0.7**	0.3	**0.2**	3.5	**-1.3**	1.2	**0.2**	1.0	**0.6**	0.9	**0.2**	1.0
SMU	**0.2**	0.4	**0.9**	0.7	**0.0**	2.0	**0.6**	0.4	**0.1**	3.5	**-1.4**	1.3	**0.1**	1.1	**0.5**	0.9	**0.1**	1.0
VNIIOFI	**-2.0**	1.1	**-1.2**	1.2	**-2.1**	2.3	**-1.6**	1.1	**-2.0**	3.6	**-3.5**	1.6	**-2.0**	1.5	**-1.6**	1.4	**-2.1**	1.4

Key comparison CCPR-K2.a

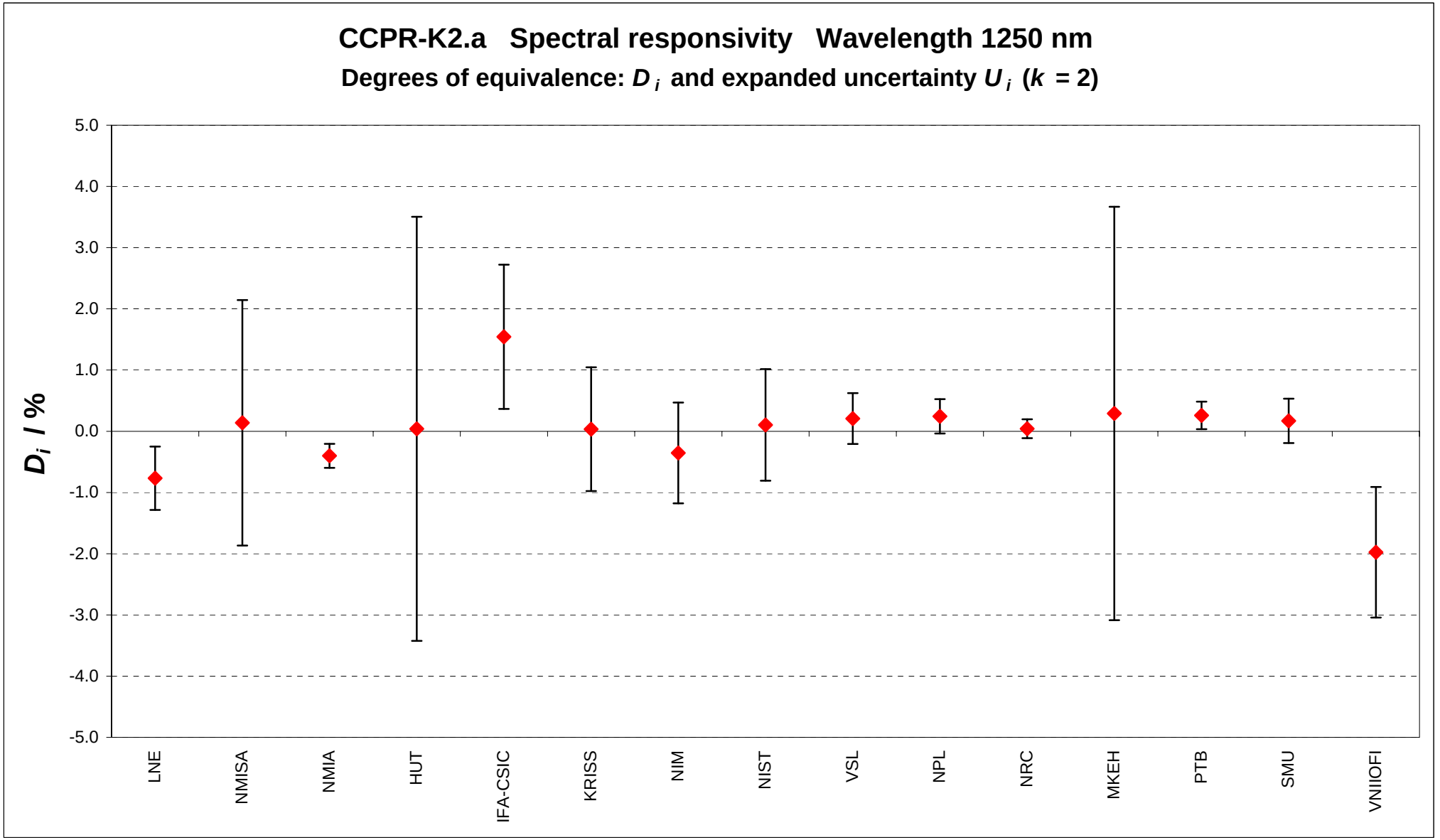
Wavelength : 1250 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5	**-1.0**	0.7	**-1.0**	0.6	**-0.8**	0.6	**-1.1**	3.4	**-1.0**	0.6	**-0.9**	0.7	**1.2**	1.2
NMISA	**0.1**	2.0	**-0.1**	2.0	**-0.1**	2.0	**0.1**	2.0	**-0.2**	3.9	**-0.1**	2.0	**0.0**	2.0	**2.1**	2.3
NMIA	**-0.4**	0.2	**-0.6**	0.5	**-0.6**	0.4	**-0.4**	0.2	**-0.7**	3.4	**-0.7**	0.3	**-0.6**	0.4	**1.6**	1.1
HUT	**0.0**	3.5	**-0.2**	3.5	**-0.2**	3.5	**0.0**	3.5	**-0.3**	4.8	**-0.2**	3.5	**-0.1**	3.5	**2.0**	3.6
IFA-CSIC	**1.5**	1.2	**1.3**	1.3	**1.3**	1.2	**1.5**	1.2	**1.3**	3.6	**1.3**	1.2	**1.4**	1.3	**3.5**	1.6
KRISS	**0.0**	1.0	**-0.2**	1.1	**-0.2**	1.1	**0.0**	1.0	**-0.3**	3.5	**-0.2**	1.0	**-0.1**	1.1	**2.0**	1.5
NIM	**-0.4**	0.8	**-0.6**	0.9	**-0.6**	0.9	**-0.4**	0.8	**-0.6**	3.5	**-0.6**	0.9	**-0.5**	0.9	**1.6**	1.4
NIST	**0.1**	0.9	**-0.1**	1.0	**-0.1**	1.0	**0.1**	0.9	**-0.2**	3.5	**-0.2**	1.0	**-0.1**	1.0	**2.1**	1.4
VSL	**0.2**	0.4			**0.0**	0.5	**0.2**	0.5	**-0.1**	3.4	**-0.1**	0.5	**0.0**	0.6	**2.2**	1.2
NPL	**0.2**	0.3	**0.0**	0.5			**0.2**	0.3	**0.0**	3.4	**0.0**	0.4	**0.1**	0.5	**2.2**	1.1
NRC	**0.0**	0.2	**-0.2**	0.5	**-0.2**	0.3			**-0.3**	3.4	**-0.2**	0.3	**-0.1**	0.4	**2.0**	1.1
MKEH	**0.3**	3.4	**0.1**	3.4	**0.0**	3.4	**0.3**	3.4			**0.0**	3.4	**0.1**	3.4	**2.3**	3.5
PTB	**0.3**	0.2	**0.1**	0.5	**0.0**	0.4	**0.2**	0.3	**0.0**	3.4			**0.1**	0.5	**2.2**	1.1
SMU	**0.2**	0.4	**0.0**	0.6	**-0.1**	0.5	**0.1**	0.4	**-0.1**	3.4	**-0.1**	0.5			**2.1**	1.1
VNIIOFI	**-2.0**	1.1	**-2.2**	1.2	**-2.2**	1.1	**-2.0**	1.1	**-2.3**	3.5	**-2.2**	1.1	**-2.1**	1.1		


CCPR-K2.a Spectral responsivity Wavelength 1250 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1300 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5			**-1.0**	2.1	**-0.5**	0.6	**-0.8**	3.5	**-2.3**	1.3	**-1.1**	1.1	**-0.5**	1.0	**-0.9**	1.0
NMISA	**0.2**	2.0	**1.0**	2.1			**0.5**	2.0	**0.2**	4.0	**-1.3**	2.3	**0.0**	2.2	**0.5**	2.2	**0.1**	2.2
NMIA	**-0.3**	0.2	**0.5**	0.6	**-0.5**	2.0			**-0.4**	3.5	**-1.8**	1.2	**-0.6**	1.0	**0.0**	0.9	**-0.4**	0.9
HUT	**0.0**	3.5	**0.8**	3.5	**-0.2**	4.0	**0.4**	3.5			**-1.4**	3.7	**-0.2**	3.6	**0.4**	3.6	**-0.1**	3.6
IFA-CSIC	**1.5**	1.2	**2.3**	1.3	**1.3**	2.3	**1.8**	1.2	**1.4**	3.7			**1.2**	1.6	**1.8**	1.5	**1.4**	1.5
KRISS	**0.2**	1.0	**1.1**	1.1	**0.0**	2.2	**0.6**	1.0	**0.2**	3.6	**-1.2**	1.6			**0.6**	1.3	**0.1**	1.3
NIM	**-0.3**	0.8	**0.5**	1.0	**-0.5**	2.2	**0.0**	0.9	**-0.4**	3.6	**-1.8**	1.5	**-0.6**	1.3			**-0.4**	1.2
NIST	**0.1**	0.9	**0.9**	1.0	**-0.1**	2.2	**0.4**	0.9	**0.1**	3.6	**-1.4**	1.5	**-0.1**	1.3	**0.4**	1.2		
VSL	**0.2**	0.4	**1.0**	0.7	**0.0**	2.0	**0.5**	0.4	**0.2**	3.5	**-1.3**	1.3	**0.0**	1.1	**0.5**	0.9	**0.1**	1.0
NPL	**0.2**	0.3	**1.0**	0.6	**0.0**	2.0	**0.6**	0.3	**0.2**	3.5	**-1.2**	1.2	**0.0**	1.0	**0.6**	0.9	**0.1**	0.9
NRC	**0.0**	0.1	**0.9**	0.6	**-0.2**	2.0	**0.4**	0.2	**0.0**	3.5	**-1.4**	1.2	**-0.2**	1.0	**0.4**	0.9	**-0.1**	0.9
MKEH	**0.5**	3.4	**1.4**	3.5	**0.3**	4.0	**0.9**	3.4	**0.5**	4.9	**-0.9**	3.6	**0.3**	3.6	**0.9**	3.5	**0.4**	3.5
PTB	**0.1**	0.2	**1.0**	0.6	**-0.1**	2.0	**0.5**	0.3	**0.1**	3.5	**-1.3**	1.2	**-0.1**	1.0	**0.5**	0.9	**0.1**	0.9
SMU	**0.2**	0.4	**1.1**	0.7	**0.0**	2.0	**0.6**	0.4	**0.2**	3.5	**-1.2**	1.3	**0.0**	1.1	**0.6**	0.9	**0.1**	0.9
VNIIOFI	**-2.2**	1.1	**-1.4**	1.2	**-2.4**	2.3	**-1.9**	1.1	**-2.2**	3.6	**-3.7**	1.6	**-2.4**	1.5	**-1.9**	1.4	**-2.3**	1.4

Key comparison CCPR-K2.a

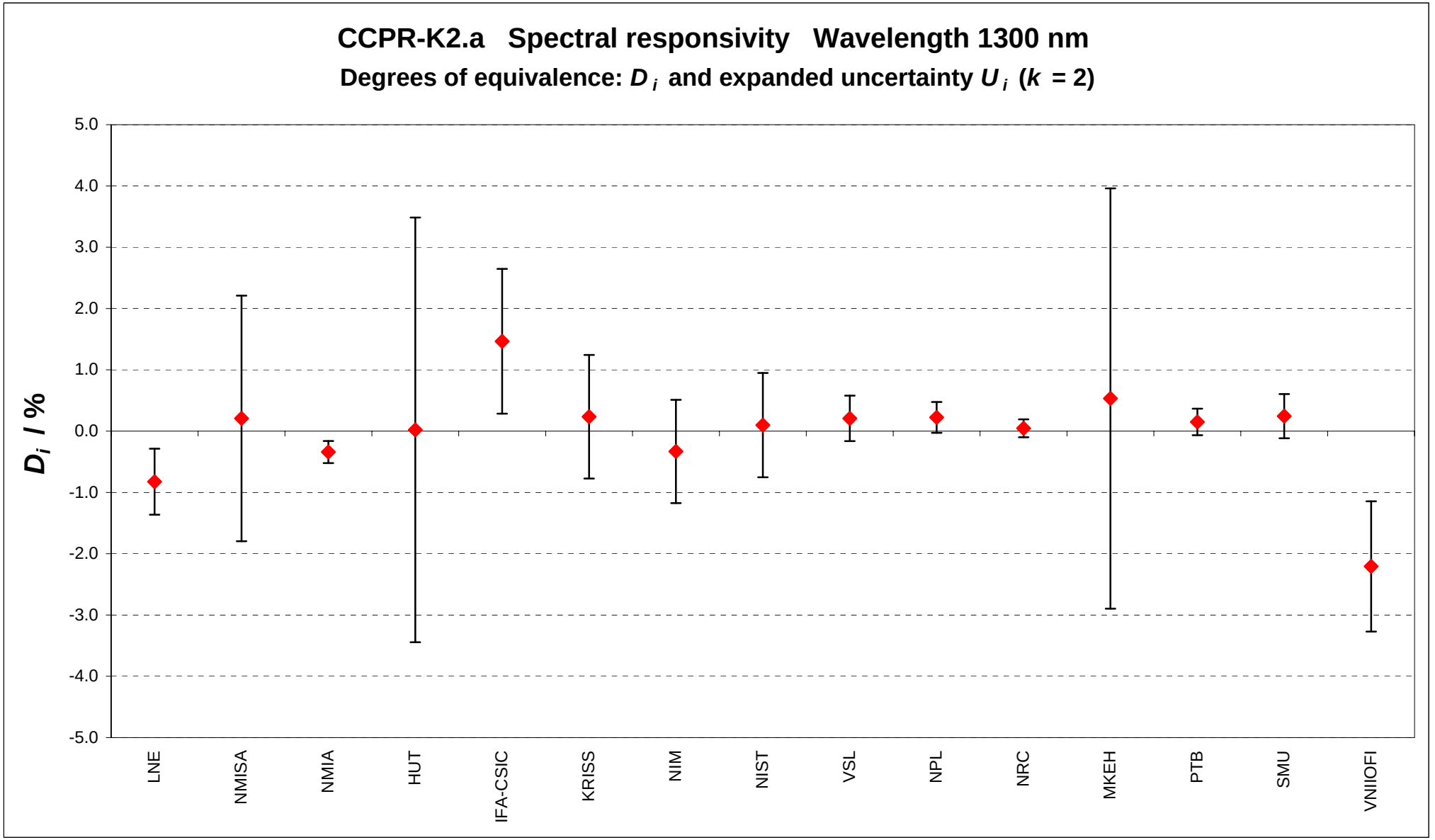
Wavelength : 1300 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5	**-1.0**	0.7	**-1.0**	0.6	**-0.9**	0.6	**-1.4**	3.5	**-1.0**	0.6	**-1.1**	0.7	**1.4**	1.2
NMISA	**0.2**	2.0	**0.0**	2.0	**0.0**	2.0	**0.2**	2.0	**-0.3**	4.0	**0.1**	2.0	**0.0**	2.0	**2.4**	2.3
NMIA	**-0.3**	0.2	**-0.5**	0.4	**-0.6**	0.3	**-0.4**	0.2	**-0.9**	3.4	**-0.5**	0.3	**-0.6**	0.4	**1.9**	1.1
HUT	**0.0**	3.5	**-0.2**	3.5	**-0.2**	3.5	**0.0**	3.5	**-0.5**	4.9	**-0.1**	3.5	**-0.2**	3.5	**2.2**	3.6
IFA-CSIC	**1.5**	1.2	**1.3**	1.3	**1.2**	1.2	**1.4**	1.2	**0.9**	3.6	**1.3**	1.2	**1.2**	1.3	**3.7**	1.6
KRISS	**0.2**	1.0	**0.0**	1.1	**0.0**	1.0	**0.2**	1.0	**-0.3**	3.6	**0.1**	1.0	**0.0**	1.1	**2.4**	1.5
NIM	**-0.3**	0.8	**-0.5**	0.9	**-0.6**	0.9	**-0.4**	0.9	**-0.9**	3.5	**-0.5**	0.9	**-0.6**	0.9	**1.9**	1.4
NIST	**0.1**	0.9	**-0.1**	1.0	**-0.1**	0.9	**0.1**	0.9	**-0.4**	3.5	**-0.1**	0.9	**-0.1**	0.9	**2.3**	1.4
VSL	**0.2**	0.4			**0.0**	0.5	**0.2**	0.4	**-0.3**	3.5	**0.1**	0.5	**0.0**	0.6	**2.4**	1.1
NPL	**0.2**	0.3	**0.0**	0.5			**0.2**	0.3	**-0.3**	3.4	**0.1**	0.4	**0.0**	0.5	**2.4**	1.1
NRC	**0.0**	0.1	**-0.2**	0.4	**-0.2**	0.3			**-0.5**	3.4	**-0.1**	0.3	**-0.2**	0.4	**2.3**	1.1
MKEH	**0.5**	3.4	**0.3**	3.5	**0.3**	3.4	**0.5**	3.4			**0.4**	3.4	**0.3**	3.5	**2.7**	3.6
PTB	**0.1**	0.2	**-0.1**	0.5	**-0.1**	0.4	**0.1**	0.3	**-0.4**	3.4			**-0.1**	0.5	**2.4**	1.1
SMU	**0.2**	0.4	**0.0**	0.6	**0.0**	0.5	**0.2**	0.4	**-0.3**	3.5	**0.1**	0.5			**2.5**	1.1
VNIIOFI	**-2.2**	1.1	**-2.4**	1.1	**-2.4**	1.1	**-2.3**	1.1	**-2.7**	3.6	**-2.4**	1.1	**-2.5**	1.1		


CCPR-K2.a Spectral responsivity Wavelength 1300 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1350 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5			**-1.4**	2.1	**-0.4**	0.6	**-1.1**	3.5	**-2.1**	1.3	**-0.5**	1.1	**-0.1**	1.0	**-0.9**	1.0
NMISA	**0.8**	2.0	**1.4**	2.1			**1.0**	2.0	**0.3**	4.0	**-0.6**	2.3	**0.9**	2.2	**1.3**	2.2	**0.5**	2.2
NMIA	**-0.2**	0.2	**0.4**	0.6	**-1.0**	2.0			**-0.7**	3.5	**-1.7**	1.2	**-0.1**	1.0	**0.2**	0.8	**-0.5**	0.9
HUT	**0.5**	3.5	**1.1**	3.5	**-0.3**	4.0	**0.7**	3.5			**-1.0**	3.7	**0.6**	3.6	**0.9**	3.6	**0.2**	3.6
IFA-CSIC	**1.4**	1.2	**2.1**	1.3	**0.6**	2.3	**1.7**	1.2	**1.0**	3.7			**1.6**	1.5	**1.9**	1.4	**1.2**	1.5
KRISS	**-0.1**	1.0	**0.5**	1.1	**-0.9**	2.2	**0.1**	1.0	**-0.6**	3.6	**-1.6**	1.5			**0.3**	1.3	**-0.4**	1.3
NIM	**-0.5**	0.8	**0.1**	1.0	**-1.3**	2.2	**-0.2**	0.8	**-0.9**	3.6	**-1.9**	1.4	**-0.3**	1.3			**-0.7**	1.2
NIST	**0.3**	0.9	**0.9**	1.0	**-0.5**	2.2	**0.5**	0.9	**-0.2**	3.6	**-1.2**	1.5	**0.4**	1.3	**0.7**	1.2		
VSL	**0.1**	0.4	**0.7**	0.7	**-0.7**	2.0	**0.3**	0.5	**-0.4**	3.5	**-1.3**	1.2	**0.2**	1.1	**0.6**	0.9	**-0.2**	1.0
NPL	**0.3**	0.3	**0.9**	0.6	**-0.5**	2.0	**0.5**	0.4	**-0.2**	3.5	**-1.1**	1.2	**0.4**	1.1	**0.8**	0.9	**0.0**	0.9
NRC	**0.0**	0.2	**0.7**	0.6	**-0.8**	2.0	**0.3**	0.3	**-0.4**	3.5	**-1.4**	1.2	**0.2**	1.0	**0.5**	0.8	**-0.2**	0.9
MKEH	**0.5**	3.4	**1.1**	3.5	**-0.3**	4.0	**0.7**	3.4	**0.0**	4.9	**-1.0**	3.6	**0.6**	3.6	**1.0**	3.5	**0.2**	3.6
PTB	**0.2**	0.2	**0.8**	0.6	**-0.6**	2.0	**0.4**	0.3	**-0.3**	3.5	**-1.3**	1.2	**0.3**	1.0	**0.6**	0.9	**-0.1**	0.9
SMU	**0.1**	0.4	**0.7**	0.7	**-0.7**	2.0	**0.3**	0.5	**-0.4**	3.5	**-1.4**	1.2	**0.2**	1.1	**0.5**	0.9	**-0.2**	1.0
VNIIOFI	**-2.6**	1.1	**-1.9**	1.2	**-3.3**	2.3	**-2.3**	1.1	**-3.0**	3.6	**-4.0**	1.6	**-2.4**	1.5	**-2.1**	1.4	**-2.8**	1.4

Key comparison CCPR-K2.a

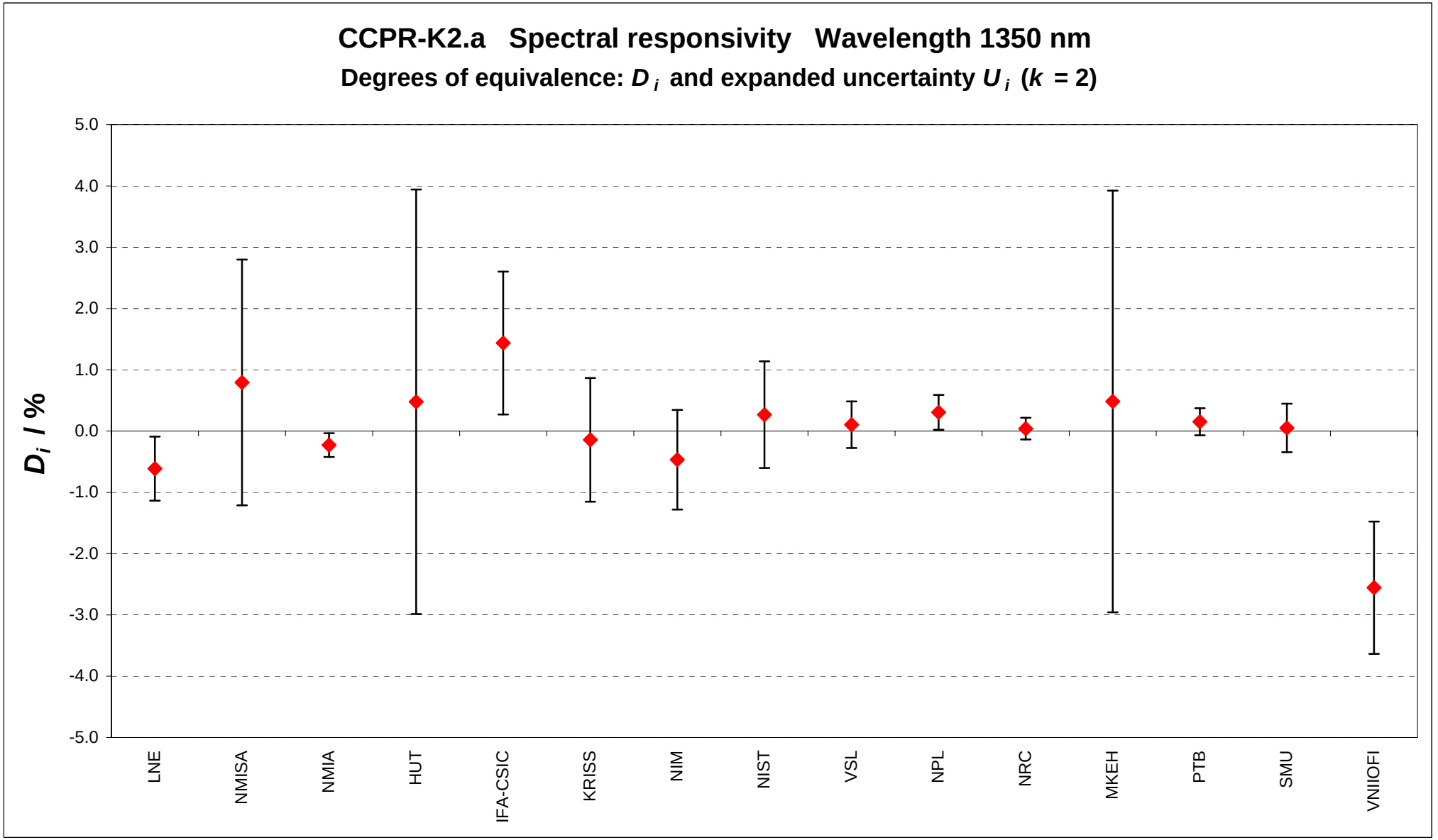
Wavelength : 1350 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5	**-0.7**	0.7	**-0.9**	0.6	**-0.7**	0.6	**-1.1**	3.5	**-0.8**	0.6	**-0.7**	0.7	**1.9**	1.2
NMISA	**0.8**	2.0	**0.7**	2.0	**0.5**	2.0	**0.8**	2.0	**0.3**	4.0	**0.6**	2.0	**0.7**	2.0	**3.3**	2.3
NMIA	**-0.2**	0.2	**-0.3**	0.5	**-0.5**	0.4	**-0.3**	0.3	**-0.7**	3.4	**-0.4**	0.3	**-0.3**	0.5	**2.3**	1.1
HUT	**0.5**	3.5	**0.4**	3.5	**0.2**	3.5	**0.4**	3.5	**0.0**	4.9	**0.3**	3.5	**0.4**	3.5	**3.0**	3.6
IFA-CSIC	**1.4**	1.2	**1.3**	1.2	**1.1**	1.2	**1.4**	1.2	**1.0**	3.6	**1.3**	1.2	**1.4**	1.2	**4.0**	1.6
KRISS	**-0.1**	1.0	**-0.2**	1.1	**-0.4**	1.1	**-0.2**	1.0	**-0.6**	3.6	**-0.3**	1.0	**-0.2**	1.1	**2.4**	1.5
NIM	**-0.5**	0.8	**-0.6**	0.9	**-0.8**	0.9	**-0.5**	0.8	**-1.0**	3.5	**-0.6**	0.9	**-0.5**	0.9	**2.1**	1.4
NIST	**0.3**	0.9	**0.2**	1.0	**0.0**	0.9	**0.2**	0.9	**-0.2**	3.6	**0.1**	0.9	**0.2**	1.0	**2.8**	1.4
VSL	**0.1**	0.4			**-0.2**	0.5	**0.1**	0.4	**-0.4**	3.5	**0.0**	0.5	**0.1**	0.6	**2.7**	1.2
NPL	**0.3**	0.3	**0.2**	0.5			**0.3**	0.4	**-0.2**	3.5	**0.2**	0.4	**0.3**	0.5	**2.9**	1.1
NRC	**0.0**	0.2	**-0.1**	0.4	**-0.3**	0.4			**-0.4**	3.4	**-0.1**	0.3	**0.0**	0.5	**2.6**	1.1
MKEH	**0.5**	3.4	**0.4**	3.5	**0.2**	3.5	**0.4**	3.4			**0.3**	3.5	**0.4**	3.5	**3.0**	3.6
PTB	**0.2**	0.2	**0.0**	0.5	**-0.2**	0.4	**0.1**	0.3	**-0.3**	3.5			**0.1**	0.5	**2.7**	1.1
SMU	**0.1**	0.4	**-0.1**	0.6	**-0.3**	0.5	**0.0**	0.5	**-0.4**	3.5	**-0.1**	0.5			**2.6**	1.2
VNIIOFI	**-2.6**	1.1	**-2.7**	1.2	**-2.9**	1.1	**-2.6**	1.1	**-3.0**	3.6	**-2.7**	1.1	**-2.6**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1350 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1400 nm

Matrix of equivalence (1/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5			**-1.6**	2.1	**-0.3**	0.6	**-0.4**	3.5	**-2.0**	1.3	**-0.5**	1.1	**-0.1**	1.0	**-1.1**	1.4
NMISA	**1.0**	2.0	**1.6**	2.1			**1.3**	2.0	**1.2**	4.0	**-0.4**	2.3	**1.1**	2.2	**1.5**	2.2	**0.5**	2.4
NMIA	**-0.3**	0.3	**0.3**	0.6	**-1.3**	2.0			**-0.1**	3.5	**-1.7**	1.2	**-0.2**	1.0	**0.2**	0.9	**-0.7**	1.3
HUT	**-0.2**	3.5	**0.4**	3.5	**-1.2**	4.0	**0.1**	3.5			**-1.6**	3.7	**-0.1**	3.6	**0.3**	3.6	**-0.7**	3.7
IFA-CSIC	**1.4**	1.1	**2.0**	1.3	**0.4**	2.3	**1.7**	1.2	**1.6**	3.7			**1.5**	1.5	**1.9**	1.4	**1.0**	1.7
KRISS	**-0.1**	1.0	**0.5**	1.1	**-1.1**	2.2	**0.2**	1.0	**0.1**	3.6	**-1.5**	1.5			**0.4**	1.3	**-0.5**	1.6
NIM	**-0.5**	0.8	**0.1**	1.0	**-1.5**	2.2	**-0.2**	0.9	**-0.3**	3.6	**-1.9**	1.4	**-0.4**	1.3			**-0.9**	1.5
NIST	**0.5**	1.2	**1.1**	1.4	**-0.5**	2.4	**0.7**	1.3	**0.7**	3.7	**-1.0**	1.7	**0.5**	1.6	**0.9**	1.5		
VSL	**0.2**	0.4	**0.8**	0.7	**-0.8**	2.0	**0.5**	0.5	**0.4**	3.5	**-1.2**	1.2	**0.3**	1.1	**0.7**	0.9	**-0.3**	1.3
NPL	**0.2**	0.3	**0.8**	0.6	**-0.8**	2.0	**0.4**	0.4	**0.4**	3.5	**-1.3**	1.2	**0.2**	1.1	**0.6**	0.9	**-0.3**	1.3
NRC	**0.0**	0.2	**0.6**	0.6	**-1.0**	2.0	**0.3**	0.3	**0.2**	3.5	**-1.4**	1.2	**0.1**	1.0	**0.5**	0.8	**-0.4**	1.3
MKEH	**0.8**	3.3	**1.4**	3.3	**-0.2**	3.8	**1.1**	3.3	**1.0**	4.8	**-0.6**	3.5	**0.9**	3.4	**1.3**	3.4	**0.3**	3.5
PTB	**0.2**	0.2	**0.8**	0.6	**-0.8**	2.0	**0.5**	0.4	**0.4**	3.5	**-1.2**	1.2	**0.3**	1.0	**0.7**	0.9	**-0.2**	1.3
SMU	**0.1**	0.4	**0.7**	0.7	**-0.9**	2.1	**0.4**	0.5	**0.3**	3.5	**-1.3**	1.2	**0.2**	1.1	**0.6**	0.9	**-0.3**	1.3
VNIIOFI	**-1.2**	1.1	**-0.6**	1.2	**-2.2**	2.3	**-0.9**	1.1	**-1.0**	3.6	**-2.6**	1.6	**-1.1**	1.5	**-0.7**	1.3	**-1.6**	1.6

Key comparison CCPR-K2.a

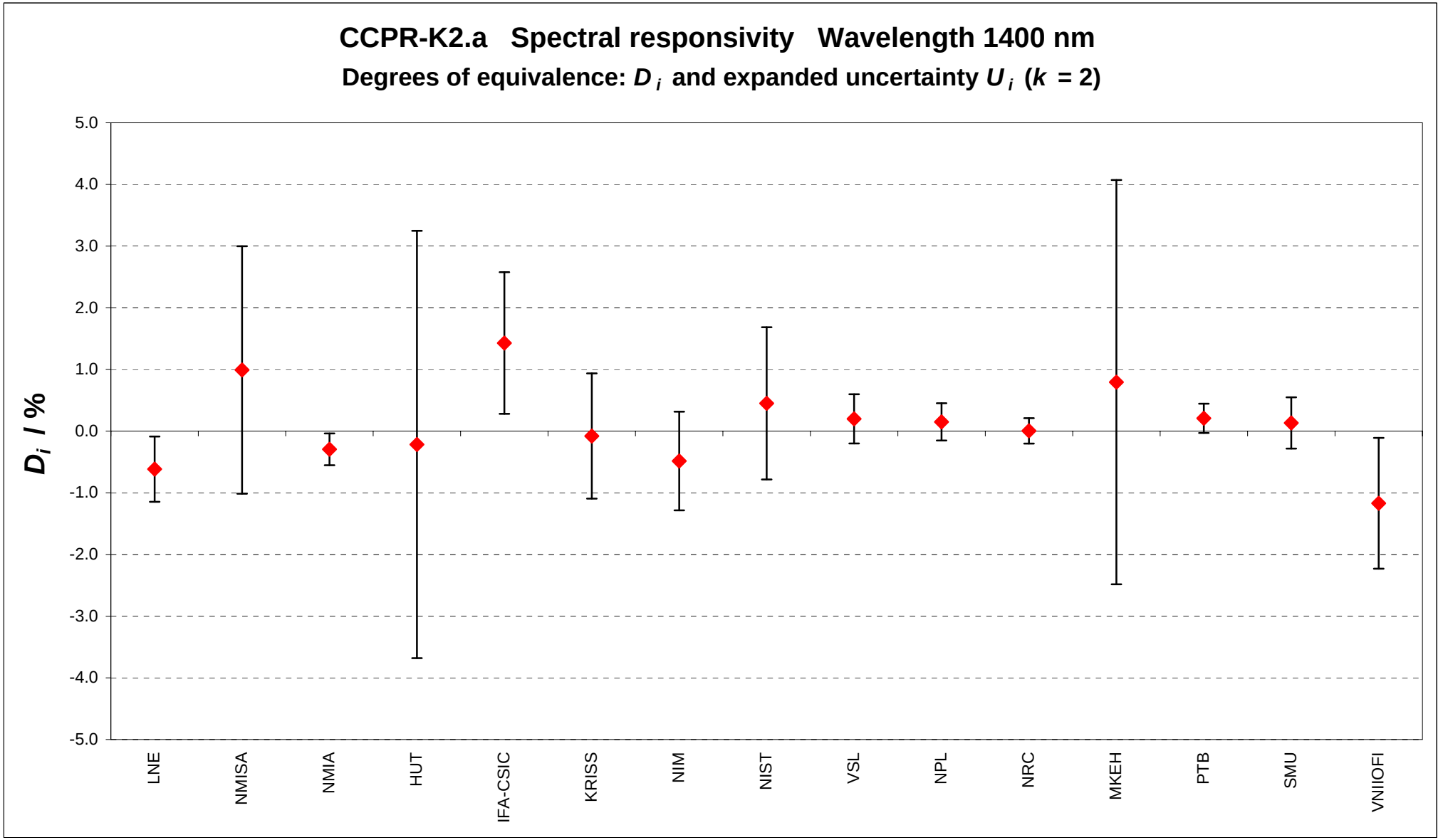
Wavelength : 1400 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5	**-0.8**	0.7	**-0.8**	0.6	**-0.6**	0.6	**-1.4**	3.3	**-0.8**	0.6	**-0.7**	0.7	**0.6**	1.2
NMISA	**1.0**	2.0	**0.8**	2.0	**0.8**	2.0	**1.0**	2.0	**0.2**	3.8	**0.8**	2.0	**0.9**	2.1	**2.2**	2.3
NMIA	**-0.3**	0.3	**-0.5**	0.5	**-0.4**	0.4	**-0.3**	0.3	**-1.1**	3.3	**-0.5**	0.4	**-0.4**	0.5	**0.9**	1.1
HUT	**-0.2**	3.5	**-0.4**	3.5	**-0.4**	3.5	**-0.2**	3.5	**-1.0**	4.8	**-0.4**	3.5	**-0.3**	3.5	**1.0**	3.6
IFA-CSIC	**1.4**	1.1	**1.2**	1.2	**1.3**	1.2	**1.4**	1.2	**0.6**	3.5	**1.2**	1.2	**1.3**	1.2	**2.6**	1.6
KRISS	**-0.1**	1.0	**-0.3**	1.1	**-0.2**	1.1	**-0.1**	1.0	**-0.9**	3.4	**-0.3**	1.0	**-0.2**	1.1	**1.1**	1.5
NIM	**-0.5**	0.8	**-0.7**	0.9	**-0.6**	0.9	**-0.5**	0.8	**-1.3**	3.4	**-0.7**	0.9	**-0.6**	0.9	**0.7**	1.3
NIST	**0.5**	1.2	**0.3**	1.3	**0.3**	1.3	**0.4**	1.3	**-0.3**	3.5	**0.2**	1.3	**0.3**	1.3	**1.6**	1.6
VSL	**0.2**	0.4			**0.0**	0.5	**0.2**	0.5	**-0.6**	3.3	**0.0**	0.5	**0.1**	0.6	**1.4**	1.2
NPL	**0.2**	0.3	**0.0**	0.5			**0.1**	0.4	**-0.6**	3.3	**-0.1**	0.4	**0.0**	0.6	**1.3**	1.1
NRC	**0.0**	0.2	**-0.2**	0.5	**-0.1**	0.4			**-0.8**	3.3	**-0.2**	0.3	**-0.1**	0.5	**1.2**	1.1
MKEH	**0.8**	3.3	**0.6**	3.3	**0.6**	3.3	**0.8**	3.3			**0.6**	3.3	**0.7**	3.3	**2.0**	3.5
PTB	**0.2**	0.2	**0.0**	0.5	**0.1**	0.4	**0.2**	0.3	**-0.6**	3.3			**0.1**	0.5	**1.4**	1.1
SMU	**0.1**	0.4	**-0.1**	0.6	**0.0**	0.6	**0.1**	0.5	**-0.7**	3.3	**-0.1**	0.5			**1.3**	1.2
VNIIOFI	**-1.2**	1.1	**-1.4**	1.2	**-1.3**	1.1	**-1.2**	1.1	**-2.0**	3.5	**-1.4**	1.1	**-1.3**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1400 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1450 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5			**-2.2**	2.1	**-0.5**	0.6	**-0.7**	3.5	**-2.3**	1.3	**-0.9**	1.1	**-0.1**	1.1	**-1.4**	1.1
NMISA	**1.4**	2.0	**2.2**	2.1			**1.7**	2.0	**1.5**	4.0	**-0.1**	2.3	**1.3**	2.2	**2.1**	2.2	**0.8**	2.2
NMIA	**-0.3**	0.2	**0.5**	0.6	**-1.7**	2.0			**-0.2**	3.5	**-1.8**	1.2	**-0.4**	1.0	**0.4**	1.0	**-0.9**	0.9
HUT	**-0.1**	3.5	**0.7**	3.5	**-1.5**	4.0	**0.2**	3.5			**-1.6**	3.7	**-0.2**	3.6	**0.6**	3.6	**-0.7**	3.6
IFA-CSIC	**1.5**	1.2	**2.3**	1.3	**0.1**	2.3	**1.8**	1.2	**1.6**	3.7			**1.4**	1.6	**2.2**	1.5	**0.9**	1.5
KRISS	**0.1**	1.0	**0.9**	1.1	**-1.3**	2.2	**0.4**	1.0	**0.2**	3.6	**-1.4**	1.6			**0.8**	1.4	**-0.5**	1.4
NIM	**-0.7**	0.9	**0.1**	1.1	**-2.1**	2.2	**-0.4**	1.0	**-0.6**	3.6	**-2.2**	1.5	**-0.8**	1.4			**-1.3**	1.3
NIST	**0.6**	0.9	**1.4**	1.1	**-0.8**	2.2	**0.9**	0.9	**0.7**	3.6	**-0.9**	1.5	**0.5**	1.4	**1.3**	1.3		
VSL	**0.2**	0.4	**1.0**	0.7	**-1.1**	2.0	**0.5**	0.5	**0.3**	3.5	**-1.2**	1.3	**0.2**	1.1	**1.0**	1.0	**-0.3**	1.0
NPL	**0.2**	0.4	**1.0**	0.7	**-1.1**	2.0	**0.5**	0.5	**0.3**	3.5	**-1.2**	1.3	**0.2**	1.1	**1.0**	1.0	**-0.3**	1.0
NRC	**0.2**	0.2	**0.9**	0.6	**-1.2**	2.0	**0.4**	0.3	**0.2**	3.5	**-1.3**	1.2	**0.1**	1.0	**0.9**	1.0	**-0.4**	0.9
MKEH	**0.9**	3.4	**1.7**	3.5	**-0.5**	4.0	**1.2**	3.4	**1.0**	4.9	**-0.6**	3.6	**0.8**	3.6	**1.6**	3.5	**0.3**	3.5
PTB	**0.0**	0.2	**0.8**	0.6	**-1.3**	2.0	**0.3**	0.4	**0.1**	3.5	**-1.4**	1.2	**0.0**	1.0	**0.8**	1.0	**-0.5**	0.9
SMU	**0.2**	0.4	**1.0**	0.7	**-1.1**	2.0	**0.5**	0.5	**0.3**	3.5	**-1.2**	1.3	**0.2**	1.1	**1.0**	1.0	**-0.3**	1.0
VNIIOFI	**-2.8**	1.1	**-2.0**	1.3	**-4.2**	2.3	**-2.5**	1.2	**-2.8**	3.6	**-4.3**	1.6	**-2.9**	1.5	**-2.1**	1.5	**-3.4**	1.4

Key comparison CCPR-K2.a

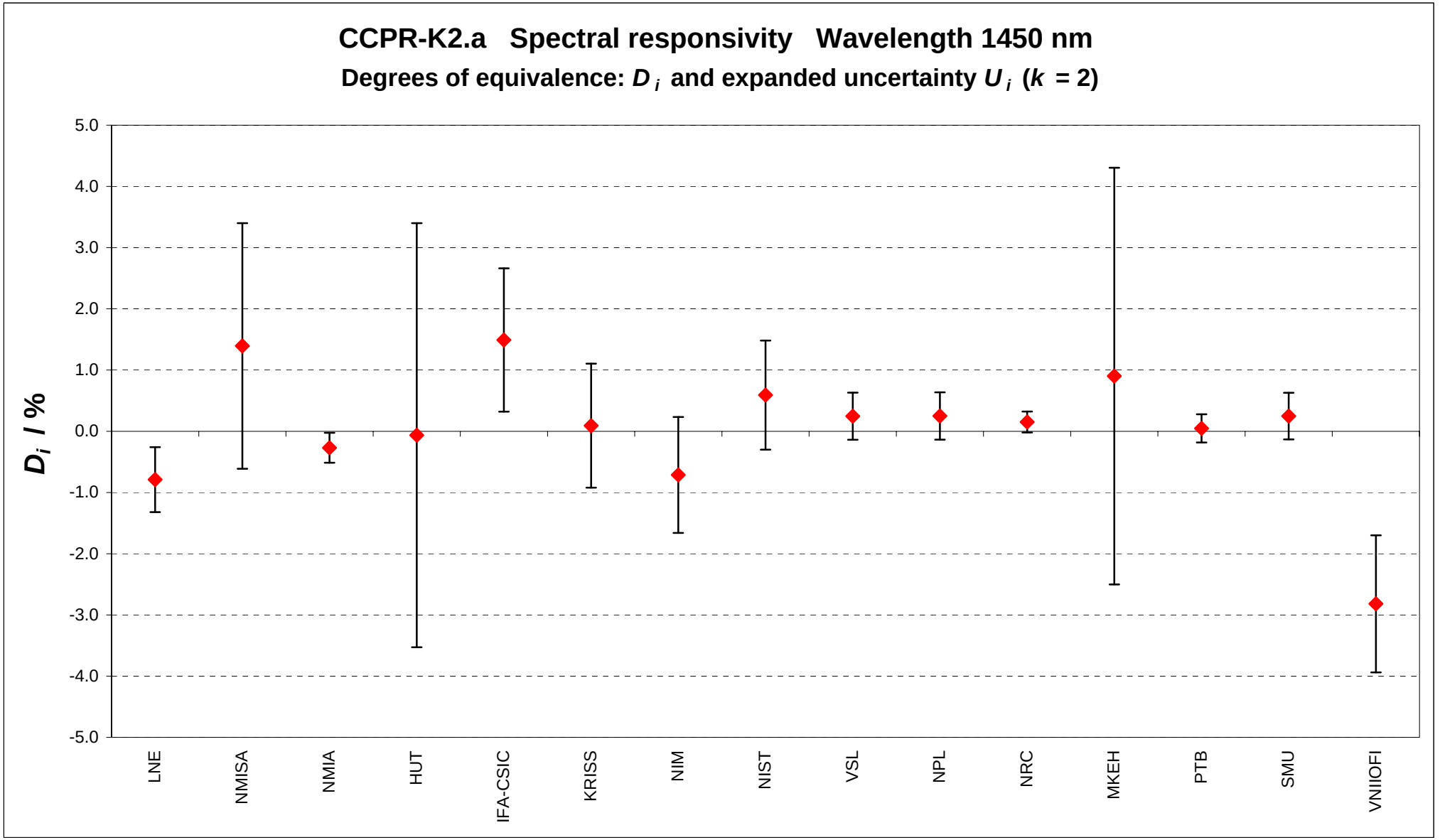
Wavelength : 1450 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.8**	0.5	**-1.0**	0.7	**-1.0**	0.7	**-0.9**	0.6	**-1.7**	3.5	**-0.8**	0.6	**-1.0**	0.7	**2.0**	1.3
NMISA	**1.4**	2.0	**1.1**	2.0	**1.1**	2.0	**1.2**	2.0	**0.5**	4.0	**1.3**	2.0	**1.1**	2.0	**4.2**	2.3
NMIA	**-0.3**	0.2	**-0.5**	0.5	**-0.5**	0.5	**-0.4**	0.3	**-1.2**	3.4	**-0.3**	0.4	**-0.5**	0.5	**2.5**	1.2
HUT	**-0.1**	3.5	**-0.3**	3.5	**-0.3**	3.5	**-0.2**	3.5	**-1.0**	4.9	**-0.1**	3.5	**-0.3**	3.5	**2.8**	3.6
IFA-CSIC	**1.5**	1.2	**1.2**	1.3	**1.2**	1.3	**1.3**	1.2	**0.6**	3.6	**1.4**	1.2	**1.2**	1.3	**4.3**	1.6
KRISS	**0.1**	1.0	**-0.2**	1.1	**-0.2**	1.1	**-0.1**	1.0	**-0.8**	3.6	**0.0**	1.0	**-0.2**	1.1	**2.9**	1.5
NIM	**-0.7**	0.9	**-1.0**	1.0	**-1.0**	1.0	**-0.9**	1.0	**-1.6**	3.5	**-0.8**	1.0	**-1.0**	1.0	**2.1**	1.5
NIST	**0.6**	0.9	**0.3**	1.0	**0.3**	1.0	**0.4**	0.9	**-0.3**	3.5	**0.5**	0.9	**0.3**	1.0	**3.4**	1.4
VSL	**0.2**	0.4			**0.0**	0.6	**0.1**	0.4	**-0.7**	3.4	**0.2**	0.5	**0.0**	0.6	**3.1**	1.2
NPL	**0.2**	0.4	**0.0**	0.6			**0.1**	0.4	**-0.7**	3.4	**0.2**	0.5	**0.0**	0.6	**3.1**	1.2
NRC	**0.2**	0.2	**-0.1**	0.4	**-0.1**	0.4			**-0.8**	3.4	**0.1**	0.3	**-0.1**	0.4	**3.0**	1.1
MKEH	**0.9**	3.4	**0.7**	3.4	**0.7**	3.4	**0.8**	3.4			**0.9**	3.4	**0.7**	3.4	**3.7**	3.6
PTB	**0.0**	0.2	**-0.2**	0.5	**-0.2**	0.5	**-0.1**	0.3	**-0.9**	3.4			**-0.2**	0.5	**2.9**	1.2
SMU	**0.2**	0.4	**0.0**	0.6	**0.0**	0.6	**0.1**	0.4	**-0.7**	3.4	**0.2**	0.5			**3.1**	1.2
VNIIOFI	**-2.8**	1.1	**-3.1**	1.2	**-3.1**	1.2	**-3.0**	1.1	**-3.7**	3.6	**-2.9**	1.2	**-3.1**	1.2		


CCPR-K2.a Spectral responsivity Wavelength 1450 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1500 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5			**-2.4**	2.1	**-0.4**	0.6	**-0.8**	3.5	**-2.1**	1.3	**-1.1**	1.2	**-0.1**	1.2	**-1.7**	1.2
NMISA	**1.7**	2.0	**2.4**	2.1			**2.0**	2.0	**1.6**	4.0	**0.4**	2.3	**1.4**	2.2	**2.4**	2.2	**0.8**	2.2
NMIA	**-0.3**	0.3	**0.4**	0.6	**-2.0**	2.0			**-0.4**	3.5	**-1.6**	1.2	**-0.7**	1.0	**0.3**	1.0	**-1.3**	1.0
HUT	**0.1**	3.5	**0.8**	3.5	**-1.6**	4.0	**0.4**	3.5			**-1.2**	3.7	**-0.2**	3.6	**0.8**	3.6	**-0.8**	3.6
IFA-CSIC	**1.3**	1.2	**2.1**	1.3	**-0.4**	2.3	**1.6**	1.2	**1.2**	3.7			**1.0**	1.5	**2.0**	1.5	**0.4**	1.5
KRISS	**0.3**	1.0	**1.1**	1.2	**-1.4**	2.2	**0.7**	1.0	**0.2**	3.6	**-1.0**	1.5			**1.0**	1.4	**-0.6**	1.4
NIM	**-0.7**	1.0	**0.1**	1.2	**-2.4**	2.2	**-0.3**	1.0	**-0.8**	3.6	**-2.0**	1.5	**-1.0**	1.4			**-1.6**	1.4
NIST	**0.9**	1.0	**1.7**	1.2	**-0.8**	2.2	**1.3**	1.0	**0.8**	3.6	**-0.4**	1.5	**0.6**	1.4	**1.6**	1.4		
VSL	**0.3**	0.4	**1.0**	0.7	**-1.4**	2.0	**0.6**	0.5	**0.2**	3.5	**-1.0**	1.2	**-0.1**	1.1	**0.9**	1.1	**-0.6**	1.1
NPL	**0.3**	0.3	**1.0**	0.7	**-1.4**	2.0	**0.6**	0.5	**0.2**	3.5	**-1.1**	1.2	**-0.1**	1.1	**0.9**	1.1	**-0.7**	1.1
NRC	**0.1**	0.2	**0.8**	0.6	**-1.6**	2.0	**0.4**	0.3	**0.0**	3.5	**-1.2**	1.2	**-0.2**	1.0	**0.8**	1.0	**-0.8**	1.0
MKEH	**0.6**	3.4	**1.3**	3.4	**-1.1**	3.9	**0.9**	3.4	**0.5**	4.8	**-0.7**	3.6	**0.2**	3.5	**1.2**	3.5	**-0.3**	3.5
PTB	**0.1**	0.2	**0.8**	0.6	**-1.6**	2.0	**0.4**	0.4	**0.0**	3.5	**-1.2**	1.2	**-0.2**	1.0	**0.8**	1.0	**-0.8**	1.0
SMU	**0.1**	0.4	**0.9**	0.7	**-1.6**	2.0	**0.5**	0.5	**0.0**	3.5	**-1.2**	1.2	**-0.2**	1.1	**0.8**	1.1	**-0.8**	1.1
VNIIOFI	**-3.2**	1.2	**-2.4**	1.4	**-4.9**	2.4	**-2.9**	1.3	**-3.3**	3.7	**-4.5**	1.7	**-3.5**	1.6	**-2.5**	1.6	**-4.1**	1.6

Key comparison CCPR-K2.a

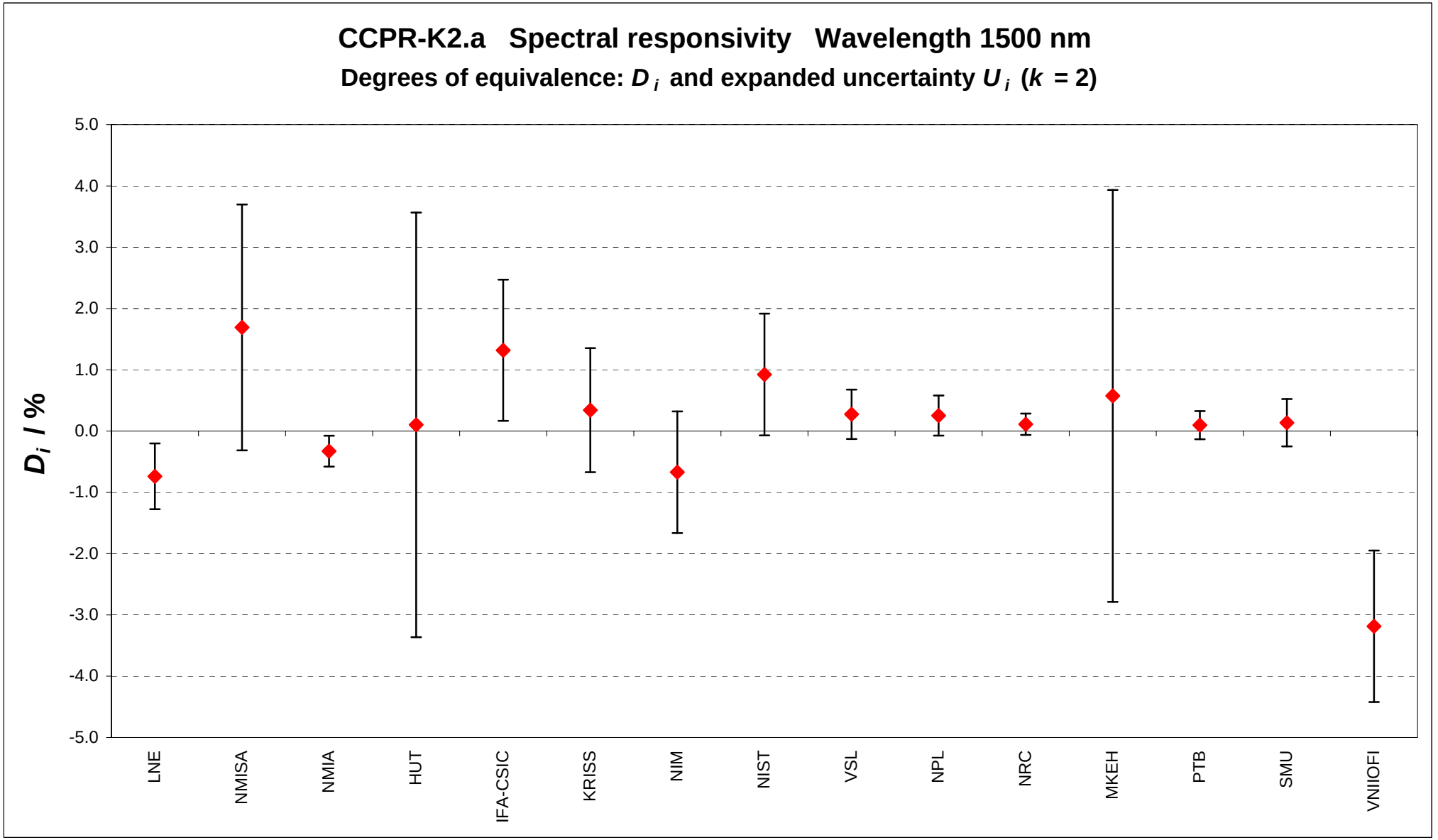
Wavelength : 1500 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5	**-1.0**	0.7	**-1.0**	0.7	**-0.8**	0.6	**-1.3**	3.4	**-0.8**	0.6	**-0.9**	0.7	**2.4**	1.4
NMISA	**1.7**	2.0	**1.4**	2.0	**1.4**	2.0	**1.6**	2.0	**1.1**	3.9	**1.6**	2.0	**1.6**	2.0	**4.9**	2.4
NMIA	**-0.3**	0.3	**-0.6**	0.5	**-0.6**	0.5	**-0.4**	0.3	**-0.9**	3.4	**-0.4**	0.4	**-0.5**	0.5	**2.9**	1.3
HUT	**0.1**	3.5	**-0.2**	3.5	**-0.2**	3.5	**0.0**	3.5	**-0.5**	4.8	**0.0**	3.5	**0.0**	3.5	**3.3**	3.7
IFA-CSIC	**1.3**	1.2	**1.0**	1.2	**1.1**	1.2	**1.2**	1.2	**0.7**	3.6	**1.2**	1.2	**1.2**	1.2	**4.5**	1.7
KRISS	**0.3**	1.0	**0.1**	1.1	**0.1**	1.1	**0.2**	1.0	**-0.2**	3.5	**0.2**	1.0	**0.2**	1.1	**3.5**	1.6
NIM	**-0.7**	1.0	**-0.9**	1.1	**-0.9**	1.1	**-0.8**	1.0	**-1.2**	3.5	**-0.8**	1.0	**-0.8**	1.1	**2.5**	1.6
NIST	**0.9**	1.0	**0.6**	1.1	**0.7**	1.1	**0.8**	1.0	**0.3**	3.5	**0.8**	1.0	**0.8**	1.1	**4.1**	1.6
VSL	**0.3**	0.4			**0.0**	0.6	**0.2**	0.5	**-0.3**	3.4	**0.2**	0.5	**0.1**	0.6	**3.5**	1.3
NPL	**0.3**	0.3	**0.0**	0.6			**0.1**	0.4	**-0.3**	3.4	**0.2**	0.4	**0.1**	0.6	**3.4**	1.3
NRC	**0.1**	0.2	**-0.2**	0.5	**-0.1**	0.4			**-0.5**	3.4	**0.0**	0.3	**0.0**	0.4	**3.3**	1.3
MKEH	**0.6**	3.4	**0.3**	3.4	**0.3**	3.4	**0.5**	3.4			**0.5**	3.4	**0.4**	3.4	**3.8**	3.6
PTB	**0.1**	0.2	**-0.2**	0.5	**-0.2**	0.4	**0.0**	0.3	**-0.5**	3.4			**0.0**	0.5	**3.3**	1.3
SMU	**0.1**	0.4	**-0.1**	0.6	**-0.1**	0.6	**0.0**	0.4	**-0.4**	3.4	**0.0**	0.5			**3.3**	1.3
VNIIOFI	**-3.2**	1.2	**-3.5**	1.3	**-3.4**	1.3	**-3.3**	1.3	**-3.8**	3.6	**-3.3**	1.3	**-3.3**	1.3		


CCPR-K2.a Spectral responsivity Wavelength 1500 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1550 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5			**-3.1**	2.1	**-0.3**	0.6	**-0.6**	3.5	**-2.1**	1.3	**-0.7**	1.2	**0.2**	1.2	**-1.2**	1.2
NMISA	**2.4**	2.0	**3.1**	2.1			**2.8**	2.0	**2.5**	4.0	**1.0**	2.3	**2.4**	2.2	**3.3**	2.3	**1.9**	2.3
NMIA	**-0.4**	0.3	**0.3**	0.6	**-2.8**	2.0			**-0.3**	3.5	**-1.8**	1.2	**-0.4**	1.0	**0.5**	1.1	**-0.9**	1.1
HUT	**-0.1**	3.5	**0.6**	3.5	**-2.5**	4.0	**0.3**	3.5			**-1.5**	3.7	**0.0**	3.6	**0.9**	3.6	**-0.6**	3.6
IFA-CSIC	**1.4**	1.2	**2.1**	1.3	**-1.0**	2.3	**1.8**	1.2	**1.5**	3.7			**1.4**	1.5	**2.3**	1.6	**0.9**	1.6
KRISS	**0.0**	1.0	**0.7**	1.2	**-2.4**	2.2	**0.4**	1.0	**0.0**	3.6	**-1.4**	1.5			**0.9**	1.5	**-0.5**	1.5
NIM	**-0.9**	1.1	**-0.2**	1.2	**-3.3**	2.3	**-0.5**	1.1	**-0.9**	3.6	**-2.3**	1.6	**-0.9**	1.5			**-1.4**	1.5
NIST	**0.5**	1.1	**1.2**	1.2	**-1.9**	2.3	**0.9**	1.1	**0.6**	3.6	**-0.9**	1.6	**0.5**	1.5	**1.4**	1.5		
VSL	**0.3**	0.8	**1.0**	1.0	**-2.1**	2.2	**0.7**	0.8	**0.4**	3.6	**-1.1**	1.4	**0.4**	1.3	**1.2**	1.3	**-0.2**	1.3
NPL	**0.2**	0.3	**0.9**	0.7	**-2.2**	2.0	**0.6**	0.5	**0.3**	3.5	**-1.1**	1.2	**0.3**	1.1	**1.2**	1.1	**-0.2**	1.1
NRC	**0.1**	0.2	**0.8**	0.6	**-2.3**	2.0	**0.5**	0.3	**0.2**	3.5	**-1.3**	1.2	**0.1**	1.0	**1.0**	1.1	**-0.4**	1.1
MKEH	**-2.7**	5.3	**-2.0**	5.3	**-5.1**	5.7	**-2.3**	5.3	**-2.7**	6.3	**-4.1**	5.4	**-2.7**	5.4	**-1.8**	5.4	**-3.2**	5.4
PTB	**0.3**	0.2	**1.0**	0.6	**-2.1**	2.0	**0.7**	0.4	**0.4**	3.5	**-1.1**	1.2	**0.3**	1.0	**1.2**	1.1	**-0.2**	1.1
SMU	**0.3**	0.4	**1.0**	0.7	**-2.1**	2.0	**0.7**	0.5	**0.3**	3.5	**-1.1**	1.2	**0.3**	1.1	**1.2**	1.2	**-0.2**	1.2
VNIIOFI	**-3.6**	1.2	**-2.9**	1.3	**-6.0**	2.3	**-3.2**	1.2	**-3.6**	3.7	**-5.0**	1.7	**-3.6**	1.6	**-2.7**	1.6	**-4.1**	1.6

Key comparison CCPR-K2.a

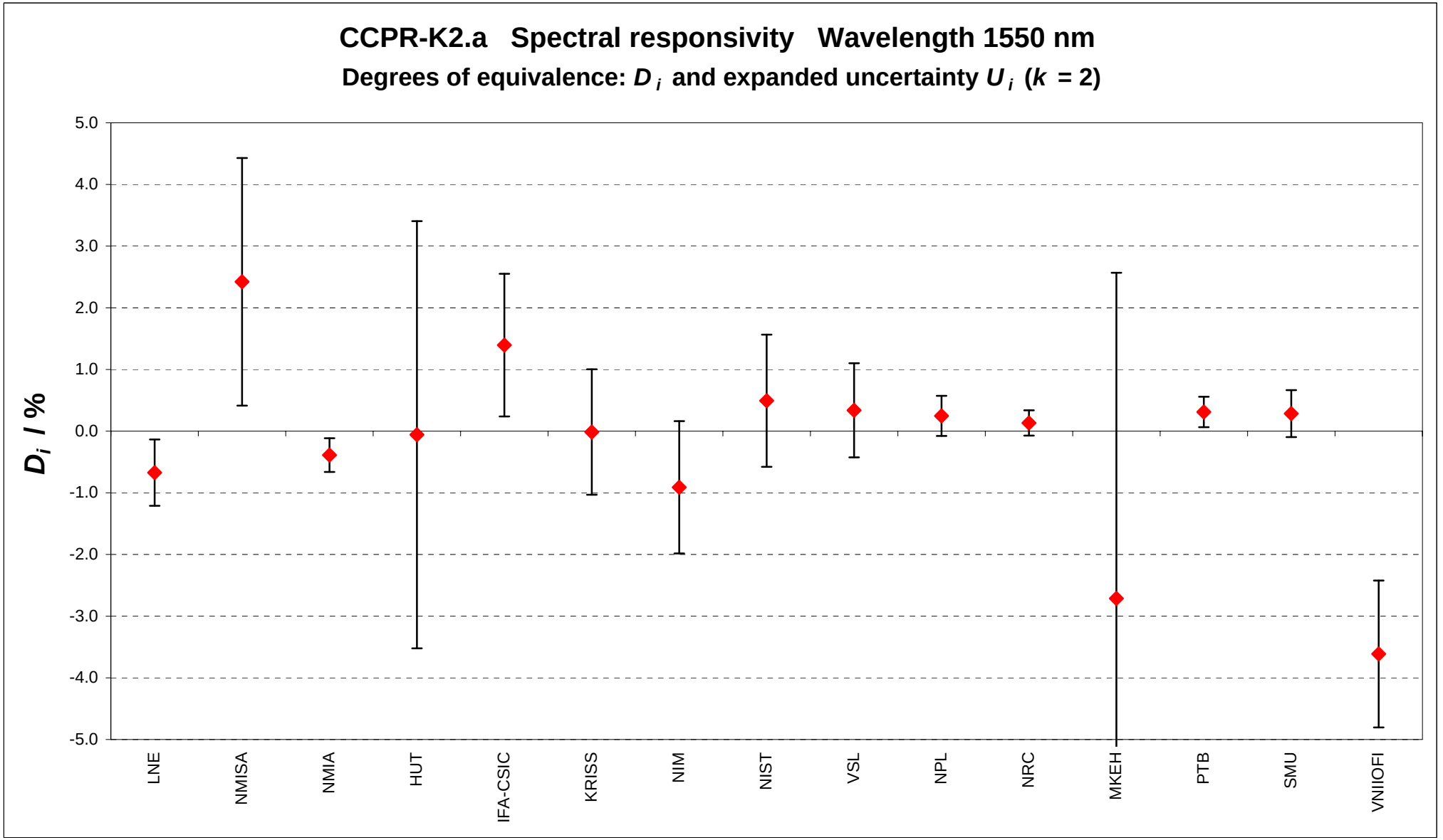
Wavelength : 1550 nm

Matrix of equivalence (2/2)

Lab *j* ⇒

Lab *i* ⇓

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.7**	0.5	**-1.0**	1.0	**-0.9**	0.7	**-0.8**	0.6	**2.0**	5.3	**-1.0**	0.6	**-1.0**	0.7	**2.9**	1.3
NMISA	**2.4**	2.0	**2.1**	2.2	**2.2**	2.0	**2.3**	2.0	**5.1**	5.7	**2.1**	2.0	**2.1**	2.0	**6.0**	2.3
NMIA	**-0.4**	0.3	**-0.7**	0.8	**-0.6**	0.5	**-0.5**	0.3	**2.3**	5.3	**-0.7**	0.4	**-0.7**	0.5	**3.2**	1.2
HUT	**-0.1**	3.5	**-0.4**	3.6	**-0.3**	3.5	**-0.2**	3.5	**2.7**	6.3	**-0.4**	3.5	**-0.3**	3.5	**3.6**	3.7
IFA-CSIC	**1.4**	1.2	**1.1**	1.4	**1.1**	1.2	**1.3**	1.2	**4.1**	5.4	**1.1**	1.2	**1.1**	1.2	**5.0**	1.7
KRISS	**0.0**	1.0	**-0.4**	1.3	**-0.3**	1.1	**-0.1**	1.0	**2.7**	5.4	**-0.3**	1.0	**-0.3**	1.1	**3.6**	1.6
NIM	**-0.9**	1.1	**-1.2**	1.3	**-1.2**	1.1	**-1.0**	1.1	**1.8**	5.4	**-1.2**	1.1	**-1.2**	1.2	**2.7**	1.6
NIST	**0.5**	1.1	**0.2**	1.3	**0.2**	1.1	**0.4**	1.1	**3.2**	5.4	**0.2**	1.1	**0.2**	1.2	**4.1**	1.6
VSL	**0.3**	0.8			**0.1**	0.9	**0.2**	0.8	**3.1**	5.3	**0.0**	0.8	**0.1**	0.9	**4.0**	1.4
NPL	**0.2**	0.3	**-0.1**	0.9			**0.1**	0.4	**3.0**	5.3	**-0.1**	0.4	**0.0**	0.6	**3.9**	1.3
NRC	**0.1**	0.2	**-0.2**	0.8	**-0.1**	0.4			**2.8**	5.3	**-0.2**	0.3	**-0.2**	0.5	**3.7**	1.2
MKEH	**-2.7**	5.3	**-3.1**	5.3	**-3.0**	5.3	**-2.8**	5.3			**-3.0**	5.3	**-3.0**	5.3	**0.9**	5.4
PTB	**0.3**	0.2	**0.0**	0.8	**0.1**	0.4	**0.2**	0.3	**3.0**	5.3			**0.0**	0.5	**3.9**	1.2
SMU	**0.3**	0.4	**-0.1**	0.9	**0.0**	0.6	**0.2**	0.5	**3.0**	5.3	**0.0**	0.5			**3.9**	1.3
VNIIOFI	**-3.6**	1.2	**-4.0**	1.4	**-3.9**	1.3	**-3.7**	1.2	**-0.9**	5.4	**-3.9**	1.2	**-3.9**	1.3		


CCPR-K2.a Spectral responsivity Wavelength 1550 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI

Key comparison CCPR-K2.a

Wavelength : 1600 nm

Matrix of equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	LNE		NMISA		NMIA		HUT		IFA-CSIC		KRISS		NIM		NIST	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5			**-3.8**	2.1	**-0.3**	0.7	**0.0**	3.5	**-2.2**	1.3	**-0.9**	1.2	**0.3**	1.3	**-1.3**	1.4
NMISA	**3.2**	2.0	**3.8**	2.1			**3.5**	2.0	**3.7**	4.0	**1.6**	2.3	**2.8**	2.3	**4.1**	2.3	**2.5**	2.4
NMIA	**-0.3**	0.3	**0.3**	0.7	**-3.5**	2.0			**0.2**	3.5	**-1.9**	1.2	**-0.7**	1.1	**0.6**	1.3	**-1.0**	1.3
HUT	**-0.6**	3.5	**0.0**	3.5	**-3.7**	4.0	**-0.2**	3.5			**-2.1**	3.7	**-0.9**	3.6	**0.4**	3.7	**-1.2**	3.7
IFA-CSIC	**1.6**	1.2	**2.2**	1.3	**-1.6**	2.3	**1.9**	1.2	**2.1**	3.7			**1.2**	1.6	**2.5**	1.7	**0.9**	1.7
KRISS	**0.3**	1.1	**0.9**	1.2	**-2.8**	2.3	**0.7**	1.1	**0.9**	3.6	**-1.2**	1.6			**1.3**	1.6	**-0.3**	1.7
NIM	**-0.9**	1.2	**-0.3**	1.3	**-4.1**	2.3	**-0.6**	1.3	**-0.4**	3.7	**-2.5**	1.7	**-1.3**	1.6			**-1.6**	1.8
NIST	**0.7**	1.3	**1.3**	1.4	**-2.5**	2.4	**1.0**	1.3	**1.2**	3.7	**-0.9**	1.7	**0.3**	1.7	**1.6**	1.8		
VSL	**0.4**	1.4	**1.0**	1.6	**-2.8**	2.5	**0.7**	1.5	**1.0**	3.8	**-1.2**	1.9	**0.1**	1.8	**1.3**	1.9	**-0.3**	1.9
NPL	**0.2**	0.4	**0.8**	0.7	**-3.0**	2.0	**0.5**	0.5	**0.8**	3.5	**-1.4**	1.3	**-0.1**	1.2	**1.1**	1.3	**-0.5**	1.4
NRC	**0.4**	0.2	**1.0**	0.6	**-2.8**	2.0	**0.7**	0.4	**0.9**	3.5	**-1.2**	1.2	**0.0**	1.1	**1.3**	1.2	**-0.3**	1.3
MKEH	**-2.0**	6.0	**-1.4**	6.1	**-5.2**	6.4	**-1.7**	6.1	**-1.5**	7.0	**-3.6**	6.2	**-2.4**	6.1	**-1.1**	6.2	**-2.7**	6.2
PTB	**0.4**	0.3	**1.0**	0.6	**-2.7**	2.0	**0.8**	0.4	**1.0**	3.5	**-1.1**	1.2	**0.1**	1.1	**1.4**	1.2	**-0.2**	1.3
SMU	**0.2**	0.4	**0.8**	0.7	**-3.0**	2.1	**0.5**	0.6	**0.7**	3.5	**-1.4**	1.3	**-0.2**	1.2	**1.1**	1.3	**-0.5**	1.4
VNIIOFI	**-4.0**	1.1	**-3.4**	1.3	**-7.1**	2.3	**-3.6**	1.2	**-3.4**	3.7	**-5.5**	1.7	**-4.3**	1.6	**-3.0**	1.7	**-4.6**	1.7

Key comparison CCPR-K2.a

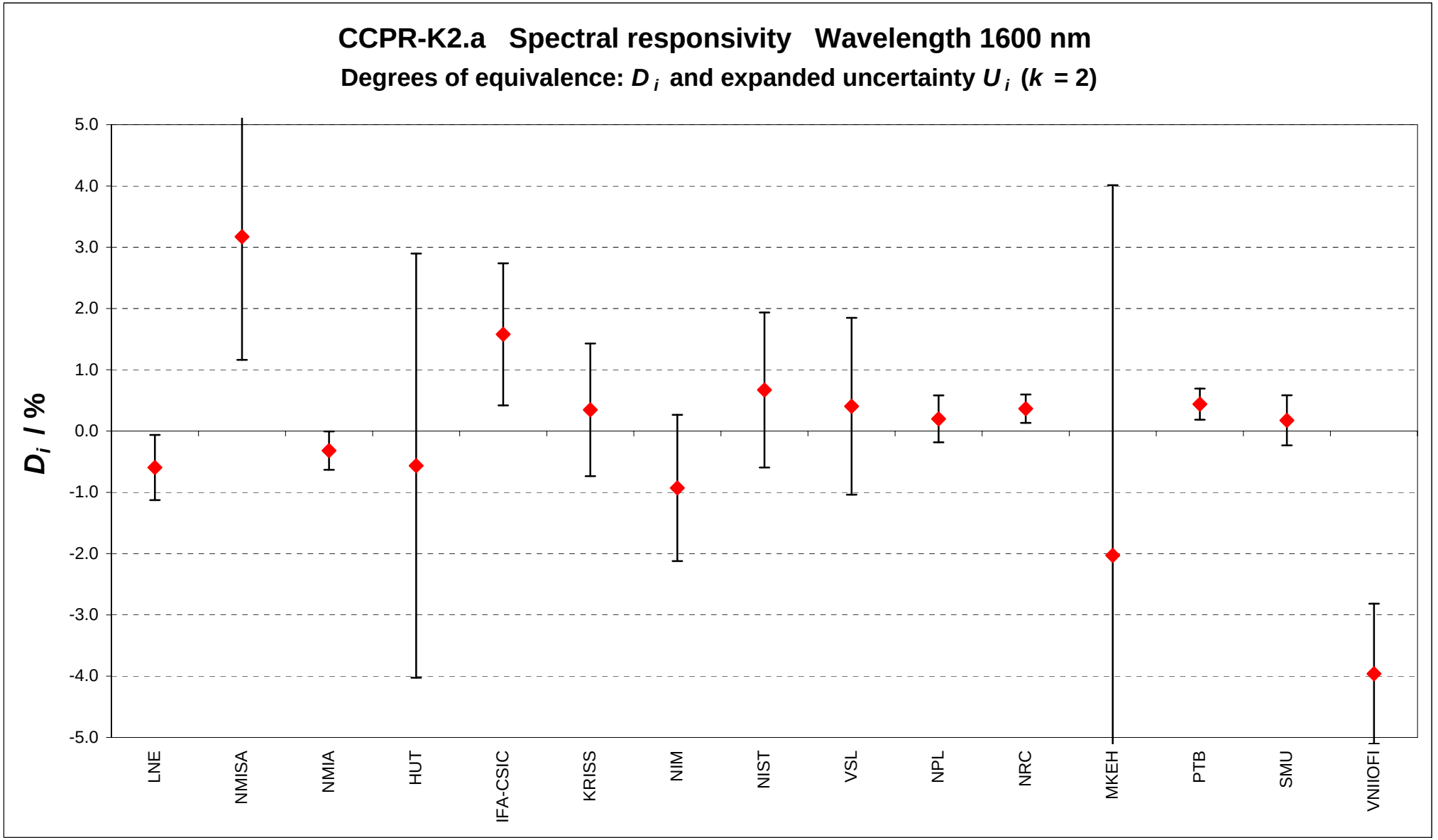
Wavelength : 1600 nm

Matrix of equivalence (2/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / %	U_i / %	VSL		NPL		NRC		MKEH		PTB		SMU		VNIIOFI	
			D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %	D_{ij} / %	U_{ij} / %
LNE	**-0.6**	0.5	**-1.0**	1.6	**-0.8**	0.7	**-1.0**	0.6	**1.4**	6.1	**-1.0**	0.6	**-0.8**	0.7	**3.4**	1.3
NMISA	**3.2**	2.0	**2.8**	2.5	**3.0**	2.0	**2.8**	2.0	**5.2**	6.4	**2.7**	2.0	**3.0**	2.1	**7.1**	2.3
NMIA	**-0.3**	0.3	**-0.7**	1.5	**-0.5**	0.5	**-0.7**	0.4	**1.7**	6.1	**-0.8**	0.4	**-0.5**	0.6	**3.6**	1.2
HUT	**-0.6**	3.5	**-1.0**	3.8	**-0.8**	3.5	**-0.9**	3.5	**1.5**	7.0	**-1.0**	3.5	**-0.7**	3.5	**3.4**	3.7
IFA-CSIC	**1.6**	1.2	**1.2**	1.9	**1.4**	1.3	**1.2**	1.2	**3.6**	6.2	**1.1**	1.2	**1.4**	1.3	**5.5**	1.7
KRISS	**0.3**	1.1	**-0.1**	1.8	**0.1**	1.2	**0.0**	1.1	**2.4**	6.1	**-0.1**	1.1	**0.2**	1.2	**4.3**	1.6
NIM	**-0.9**	1.2	**-1.3**	1.9	**-1.1**	1.3	**-1.3**	1.2	**1.1**	6.2	**-1.4**	1.2	**-1.1**	1.3	**3.0**	1.7
NIST	**0.7**	1.3	**0.3**	1.9	**0.5**	1.4	**0.3**	1.3	**2.7**	6.2	**0.2**	1.3	**0.5**	1.4	**4.6**	1.7
VSL	**0.4**	1.4			**0.2**	1.5	**0.0**	1.5	**2.4**	6.2	**0.0**	1.5	**0.2**	1.5	**4.4**	1.9
NPL	**0.2**	0.4	**-0.2**	1.5			**-0.2**	0.5	**2.2**	6.1	**-0.2**	0.5	**0.0**	0.6	**4.2**	1.2
NRC	**0.4**	0.2	**0.0**	1.5	**0.2**	0.5			**2.4**	6.1	**-0.1**	0.3	**0.2**	0.5	**4.3**	1.2
MKEH	**-2.0**	6.0	**-2.4**	6.2	**-2.2**	6.1	**-2.4**	6.1			**-2.5**	6.1	**-2.2**	6.1	**1.9**	6.2
PTB	**0.4**	0.3	**0.0**	1.5	**0.2**	0.5	**0.1**	0.3	**2.5**	6.1			**0.3**	0.5	**4.4**	1.2
SMU	**0.2**	0.4	**-0.2**	1.5	**0.0**	0.6	**-0.2**	0.5	**2.2**	6.1	**-0.3**	0.5			**4.1**	1.3
VNIIOFI	**-4.0**	1.1	**-4.4**	1.9	**-4.2**	1.2	**-4.3**	1.2	**-1.9**	6.2	**-4.4**	1.2	**-4.1**	1.3		


CCPR-K2.a Spectral responsivity Wavelength 1600 nm
Degrees of equivalence: D_i and expanded uncertainty U_i (k = 2)
D_i / %
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
LNE
NMISA
NMIA
HUT
IFA-CSIC
KRISS
NIM
NIST
VSL
NPL
NRC
MKEH
PTB
SMU
VNIIOFI