

Key comparison CCPR-K5 and EURAMET.PR-K5

MEASURAND : Spectral diffuse reflectance

WAVELENGTH : 360 nm to 820 nm

CCPR-K5

The laboratory individual measurements of all transfer samples (Spectralon and matte white ceramic tile) and corresponding standard uncertainties are given in Sections 9 and 10 of the Final Report, respectively.

The data obtained by the Pilot laboratory, NIST, are given in Section 11 of the Final Report.

Degrees of equivalence are produced from the combined results of both types of samples, but excluding data from 360 nm to 440 nm of ceramic tile samples (reasons for this are explained in Section 12 of the Final Report).

For each wavelength, the key comparison reference value was calculated as a weighted mean of the participants' results with a cut-off, as detailed in Section 13 of the Final Report (see Tables 13.1 and 13.2).

The degree of equivalence of each laboratory with respect to the key comparison reference value is given by a pair of relative terms: D_i and U_i , its expanded uncertainty ($k = 2$), both expressed in % (see equations 13.18 and 13.19 on page 147 of the Final Report).

EURAMET.PR-K5

The linking of EURAMET.PR-K5 to CCPR-K5 is made via METAS who participated in both comparisons.

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

Key comparison CCPR-K5 and EURAMET.PR-K5

MEASURAND : Spectral diffuse reflectance

WAVELENGTH : 360 nm to 820 nm

Degrees of equivalence relative to the key comparison reference values

Lab <i>i</i>	360 nm		380 nm		400 nm		420 nm		440 nm		460 nm		480 nm		500 nm	
	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i	D_i 1%	U_i
NMISA	-0.10	0.68	0.15	0.67	0.14	0.53	0.03	0.52	-0.15	0.52	0.19	0.59	0.06	0.44	0.05	0.44
HUT	0.27	0.44	0.31	0.43	0.33	0.42	0.26	0.42	0.27	0.42	0.25	0.41	0.27	0.41	0.26	0.41
IO-CSIC	-	-	-1.38	0.65	-1.40	0.64	-1.13	0.64	-0.92	0.64	-0.82	0.63	-0.44	0.46	-0.69	0.46
KRISS	-	-	-0.25	1.07	-0.17	0.66	-0.19	0.51	-0.14	0.46	-0.09	0.47	-0.10	0.44	-0.06	0.43
MSL	0.12	0.43	0.12	0.41	0.17	0.41	0.14	0.40	0.12	0.40	0.14	0.42	0.15	0.42	0.17	0.42
NIM	-0.75	2.14	-0.72	1.62	-0.69	1.51	-0.59	1.45	-0.40	1.47	-0.66	1.46	-0.63	1.46	-0.62	1.46
NMIJ	-0.02	0.50	-0.08	0.49	-0.07	0.47	-0.19	0.47	-0.18	0.31	-0.09	0.29	-0.11	0.29	-0.13	0.29
NIST	-0.04	0.25	0.04	0.26	-0.18	0.25	0.02	0.26	-0.01	0.26	0.08	0.26	0.10	0.26	0.06	0.26
NPL	0.33	0.55	0.50	0.40	0.73	0.27	0.71	0.25	0.73	0.26	0.58	0.26	0.55	0.24	0.58	0.24
NRC	-0.08	0.31	-0.10	0.29	-0.19	0.22	-0.24	0.21	-0.20	0.20	-0.10	0.20	-0.09	0.22	-0.11	0.19
MKEH	-0.20	1.22	-0.03	0.89	-0.04	0.80	-0.02	0.77	0.04	0.76	0.09	0.75	0.10	0.68	0.09	0.66
PTB	-0.18	0.26	-0.09	0.23	-0.06	0.21	-0.08	0.20	-0.02	0.19	-0.17	0.18	-0.16	0.18	-0.07	0.17
VNIOFI	-0.15	0.95	-0.17	0.76	-0.32	0.57	-0.46	0.51	-0.53	0.44	-0.71	0.44	-0.70	0.43	-0.61	0.43
GUM	-	-	-0.21	0.91	-0.14	0.70	-0.16	0.64	-0.04	0.62	0.00	0.63	0.02	0.60	0.04	0.57
INM	-3.88	1.43	-0.85	0.94	-0.12	0.80	0.07	0.75	0.25	0.74	0.33	0.79	0.34	0.78	0.20	0.77
LNE	-0.03	1.38	-0.05	1.05	0.13	0.92	0.01	0.74	0.19	0.68	0.17	0.68	0.13	0.67	0.18	0.66
METAS	0.50	1.39	0.33	1.07	0.67	0.94	0.43	0.77	0.40	0.70	0.38	0.66	0.37	0.59	0.33	0.57
PTB	-0.12	0.99	0.06	0.68	-0.08	0.52	-0.10	0.49	0.02	0.45	0.03	0.44	0.01	0.41	0.05	0.44
RISE	0.06	1.29	0.32	1.06	0.48	0.94	0.26	0.81	0.16	0.78	0.09	0.79	-0.04	0.78	-0.12	0.80

Key comparison CCPR-K5 and EURAMET.PR-K5

MEASURAND : Spectral diffuse reflectance

WAVELENGTH : 360 nm to 820 nm

Degrees of equivalence relative to the key comparison reference values (Continued)

Lab <i>i</i>	520 nm		540 nm		560 nm		580 nm		600 nm		620 nm		640 nm		660 nm	
	D_i	U_i	D_i	U_i	D_i	U_i	D_i	U_i	D_i	U_i	D_i	U_i	D_i	U_i	D_i	U_i
	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
NMISA	0.14	0.44	0.09	0.43	-0.05	0.43	-0.10	0.43	-0.06	0.43	0.01	0.43	-0.13	0.43	-0.15	0.43
HUT	0.21	0.41	0.21	0.41	0.21	0.41	0.22	0.41	0.24	0.41	0.22	0.41	0.22	0.41	0.23	0.41
IO-CSIC	-0.57	0.46	-0.56	0.46	-0.34	0.46	-0.45	0.46	-0.38	0.46	-0.40	0.46	-0.29	0.46	-0.34	0.46
KRISS	-0.04	0.41	-0.02	0.40	-0.02	0.40	-0.01	0.41	0.03	0.42	0.00	0.41	-0.03	0.41	0.00	0.40
MSL	0.11	0.42	0.11	0.42	0.10	0.42	0.09	0.42	0.13	0.42	0.12	0.42	0.13	0.42	0.13	0.42
NIM	-0.68	1.46	-0.71	1.46	-0.73	1.46	-0.66	1.46	-0.76	1.46	-0.78	1.46	-0.77	1.46	-0.78	1.46
NMIJ	-0.13	0.29	-0.10	0.29	-0.09	0.29	-0.10	0.29	-0.09	0.29	-0.06	0.29	-0.06	0.29	-0.05	0.29
NIST	0.03	0.25	0.05	0.25	0.03	0.26	0.05	0.26	0.03	0.25	0.01	0.25	0.05	0.25	0.01	0.25
NPL	0.58	0.23	0.56	0.23	0.53	0.24	0.54	0.24	0.47	0.23	0.47	0.23	0.49	0.25	0.51	0.24
NRC	-0.13	0.20	-0.15	0.20	-0.15	0.19	-0.07	0.21	-0.14	0.19	-0.14	0.19	-0.12	0.19	-0.15	0.19
MKEH	0.14	0.65	0.13	0.63	0.09	0.63	0.08	0.63	0.13	0.62	0.13	0.61	0.08	0.61	0.12	0.60
PTB	-0.10	0.17	-0.10	0.17	-0.07	0.17	-0.09	0.17	-0.08	0.17	-0.08	0.17	-0.08	0.17	-0.07	0.17
VNIOFI	-0.62	0.43	-0.59	0.43	-0.56	0.43	-0.57	0.43	-0.49	0.43	-0.52	0.43	-0.57	0.43	-0.56	0.43
GUM	0.10	0.60	0.10	0.60	0.11	0.56	0.13	0.56	0.12	0.55	0.15	0.58	0.10	0.57	0.06	0.56
INM	0.13	0.79	0.05	0.77	0.17	0.72	0.02	0.72	0.09	0.73	-0.03	0.74	0.02	0.77	0.05	0.72
LNE	0.08	0.68	0.05	0.69	0.14	0.70	0.06	0.72	0.07	0.70	0.05	0.75	0.00	0.75	-0.05	0.81
METAS	0.29	0.57	0.32	0.55	0.33	0.55	0.32	0.54	0.32	0.54	0.34	0.54	0.33	0.55	0.26	0.55
PTB	0.05	0.42	0.05	0.41	0.06	0.41	0.05	0.41	0.06	0.43	0.08	0.43	0.06	0.45	0.03	0.41
RISE	-0.17	0.74	-0.17	0.76	-0.17	0.78	-0.19	0.76	-0.17	0.74	-0.16	0.78	-0.21	0.80	-0.24	0.80

Key comparison CCPR-K5 and EURAMET.PR-K5

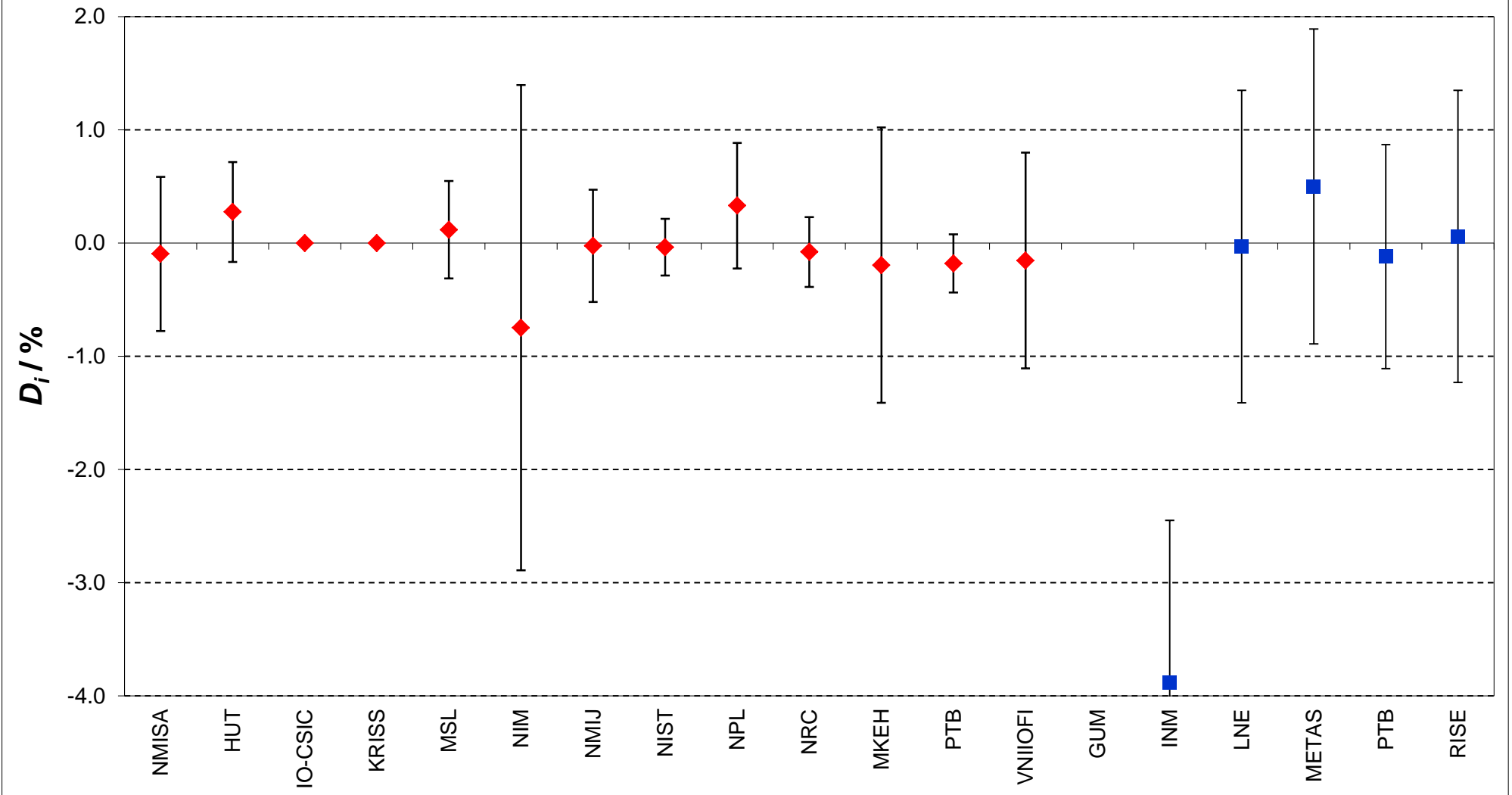
MEASURAND : Spectral diffuse reflectance

WAVELENGTH : 360 nm to 820 nm

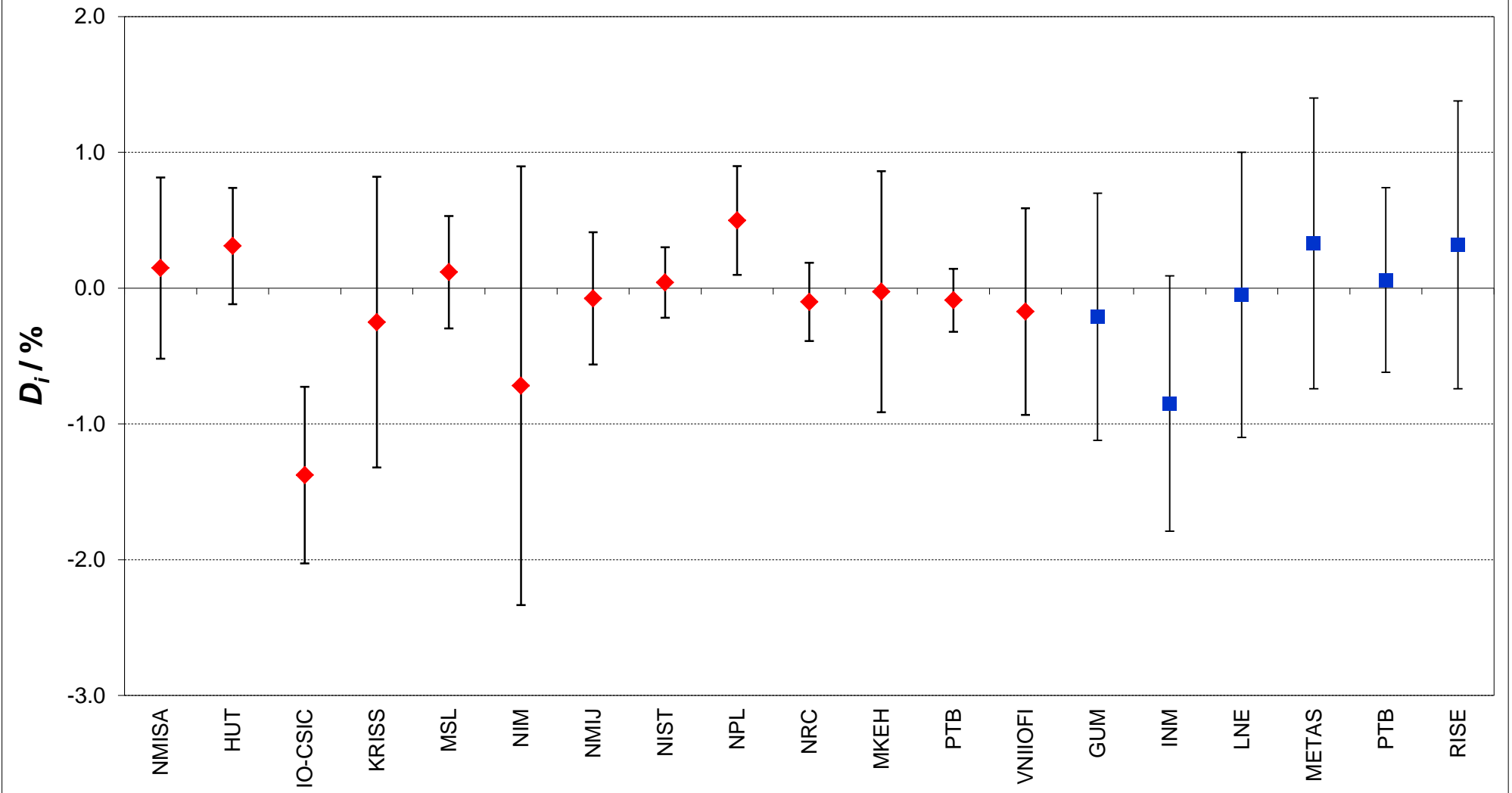
Degrees of equivalence relative to the key comparison reference values (Continued)

Lab <i>i</i>	680 nm		700 nm		720 nm		740 nm		760 nm		780 nm		800 nm		820 nm	
	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>	<i>D_i</i>	<i>U_i</i>
	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
NMISA	-0.26	0.43	-0.16	0.43	-0.29	0.43	-0.21	0.43	-0.37	0.43	-0.43	0.43	-0.45	0.62	-0.40	0.61
HUT	0.27	0.41	0.29	0.41	0.28	0.41	0.28	0.41	0.33	0.41	0.33	0.41	0.26	0.41	0.33	0.41
IO-CSIC	-0.26	0.46	-0.28	0.46	-0.18	0.46	-0.17	0.46	-0.23	0.46	-0.17	0.46	-	-	-	-
KRISS	0.01	0.42	0.03	0.41	-0.03	0.39	-0.07	0.39	-0.05	0.42	-0.09	0.41	-	-	-	-
MSL	0.14	0.42	0.14	0.42	0.15	0.42	0.13	0.42	0.15	0.41	0.15	0.41	0.05	0.41	0.08	0.41
NIM	-0.77	1.46	-0.76	1.46	-0.76	1.46	-0.73	1.46	-0.70	1.46	-0.67	1.46	-0.68	1.46	-0.66	1.56
NMIJ	-0.02	0.29	-0.02	0.29	0.01	0.29	0.00	0.29	0.01	0.41	0.01	0.41	-0.10	0.41	-0.10	0.41
NIST	0.06	0.25	-0.03	0.26	0.07	0.25	0.04	0.26	0.09	0.25	0.05	0.26	0.01	0.25	0.04	0.25
NPL	0.47	0.23	0.48	0.23	0.44	0.23	0.45	0.23	0.43	0.24	0.45	0.23	0.44	0.22	0.41	0.24
NRC	-0.20	0.19	-0.22	0.19	-0.23	0.19	-0.20	0.19	-0.18	0.19	-0.17	0.19	-0.18	0.18	-0.17	0.19
MKEH	0.09	0.61	0.12	0.61	0.08	0.61	0.01	0.62	0.06	0.62	0.15	0.64	-	-	-	-
PTB	-0.07	0.17	-0.02	0.17	-0.06	0.17	-0.05	0.17	-0.05	0.18	-0.07	0.17	-0.09	0.16	-0.09	0.17
VNIOFI	-0.52	0.43	-0.54	0.43	-0.51	0.43	-0.51	0.43	-0.46	0.43	-0.40	0.42	-0.44	0.42	-0.53	0.42
GUM	0.08	0.62	0.09	0.60	0.05	0.59	-0.02	0.55	0.01	0.56	0.15	0.61	-	-	-	-
INM	0.08	0.73	0.02	0.71	-0.05	0.70	0.01	0.70	-0.05	0.72	0.05	0.73	-	-	-	-
LNE	-0.09	0.89	-0.11	0.86	-0.13	0.91	-0.22	0.93	-0.20	0.98	-0.07	0.99	-	-	-	-
METAS	0.25	0.56	0.31	0.60	0.26	0.61	0.18	0.60	0.18	0.69	0.26	0.68	-	-	-	-
PTB	0.03	0.44	0.06	0.43	0.03	0.42	0.03	0.42	0.06	0.42	0.11	0.43	-	-	-	-
RISE	-0.24	0.86	-0.21	0.81	-0.23	0.86	-0.33	0.86	-0.30	0.88	-0.25	0.92	-	-	-	-

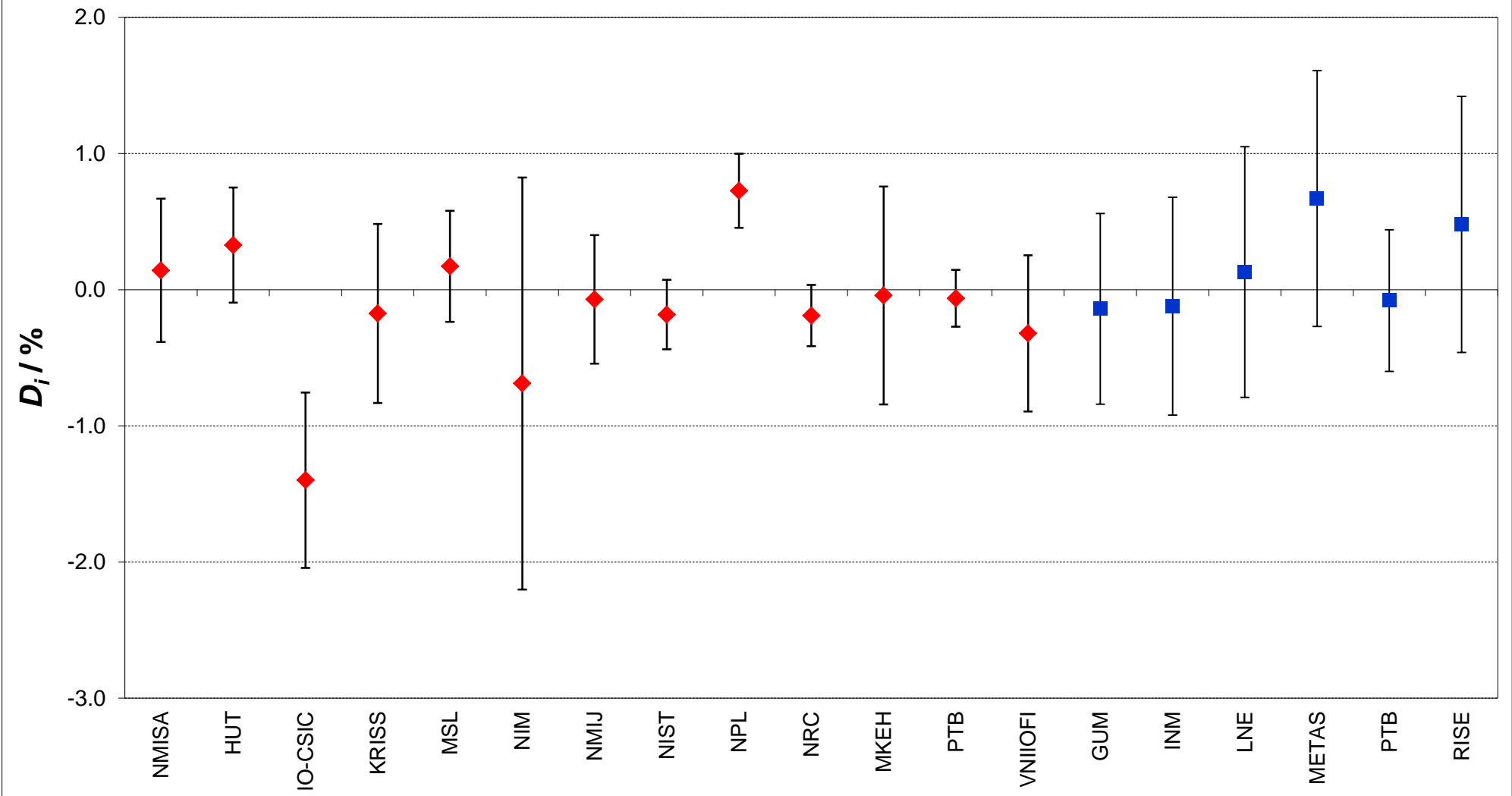
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 360 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



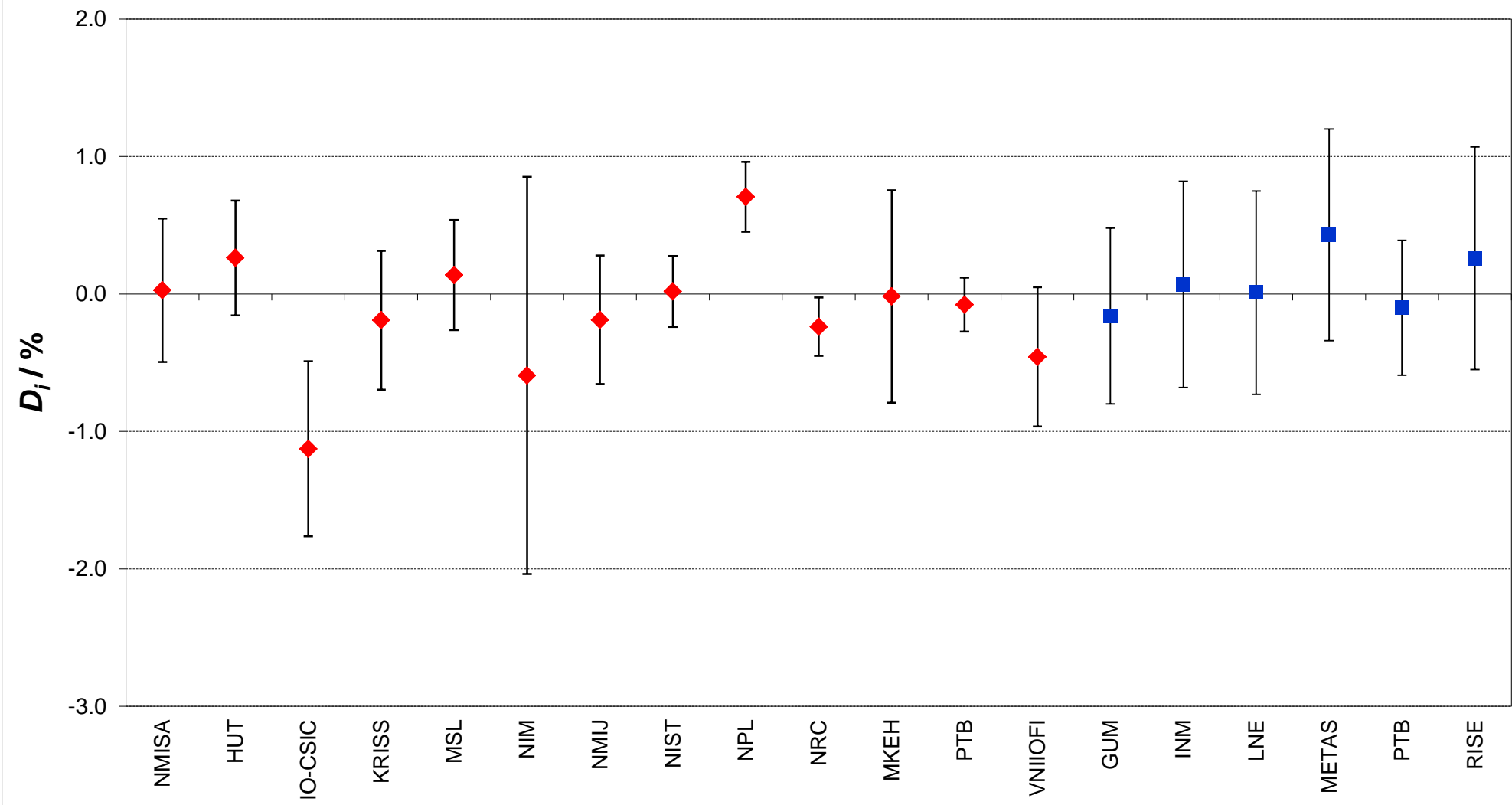
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 380 nm
 Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



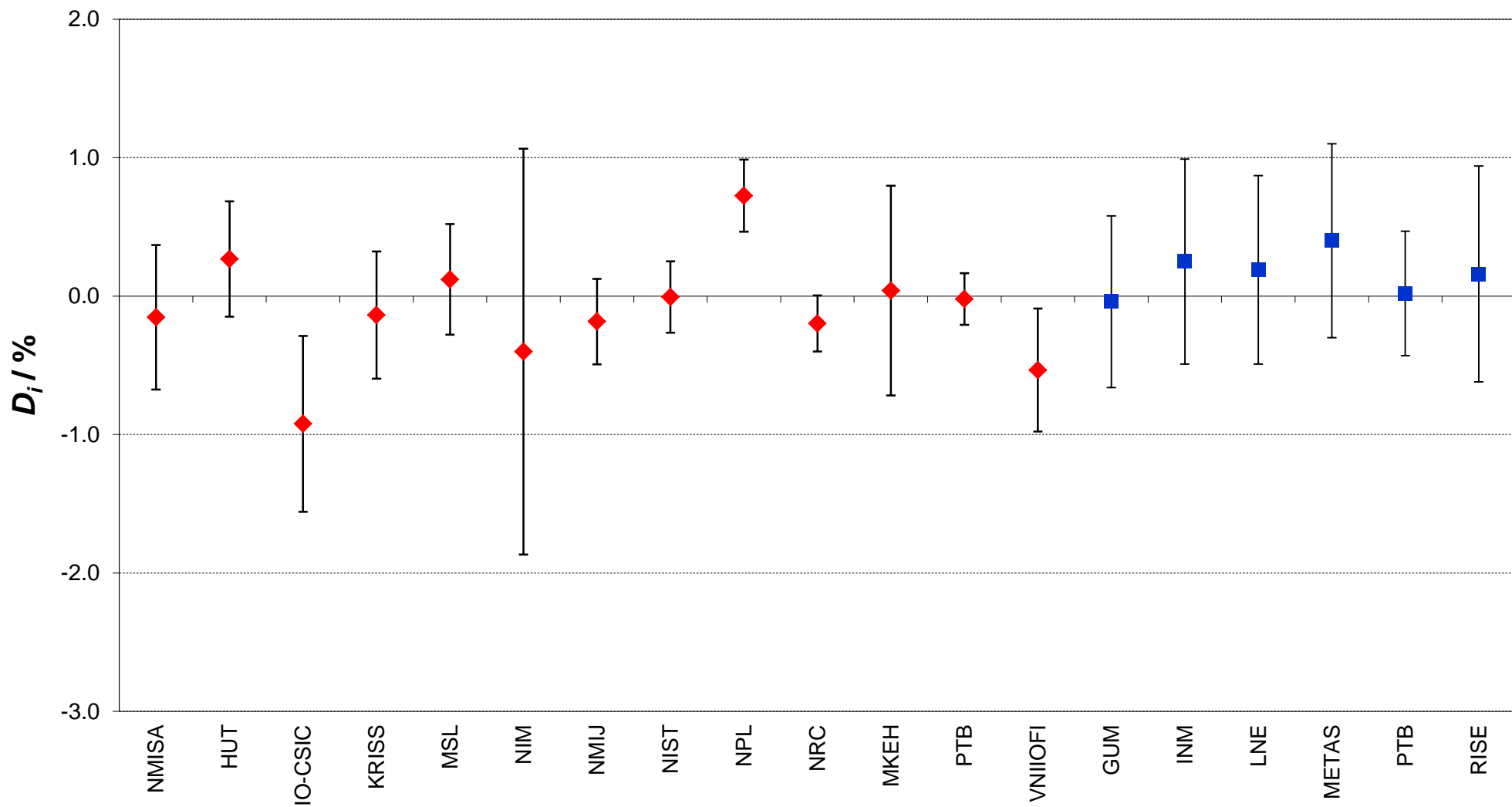
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 400 nm
Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



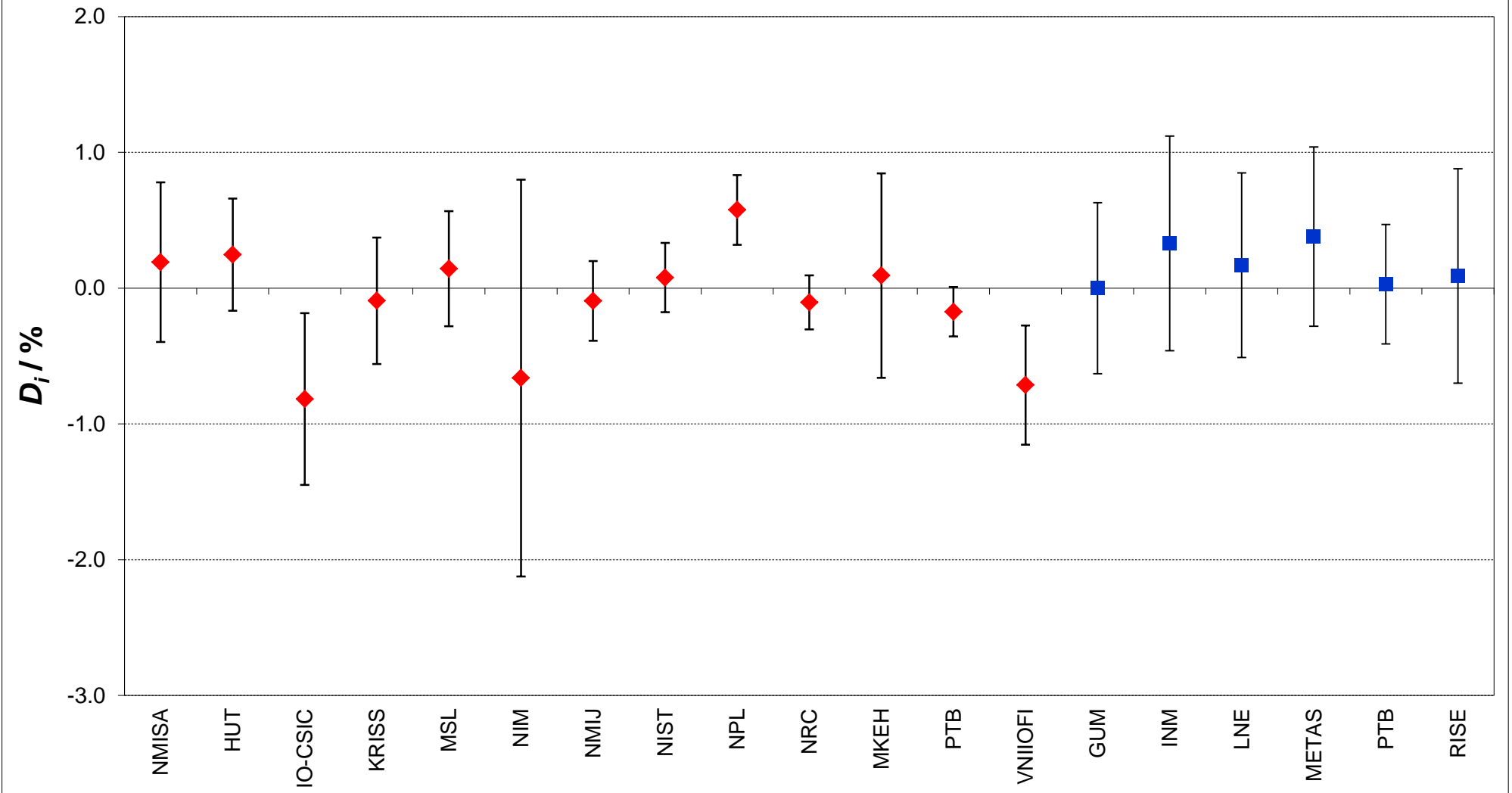
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 420 nm
Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



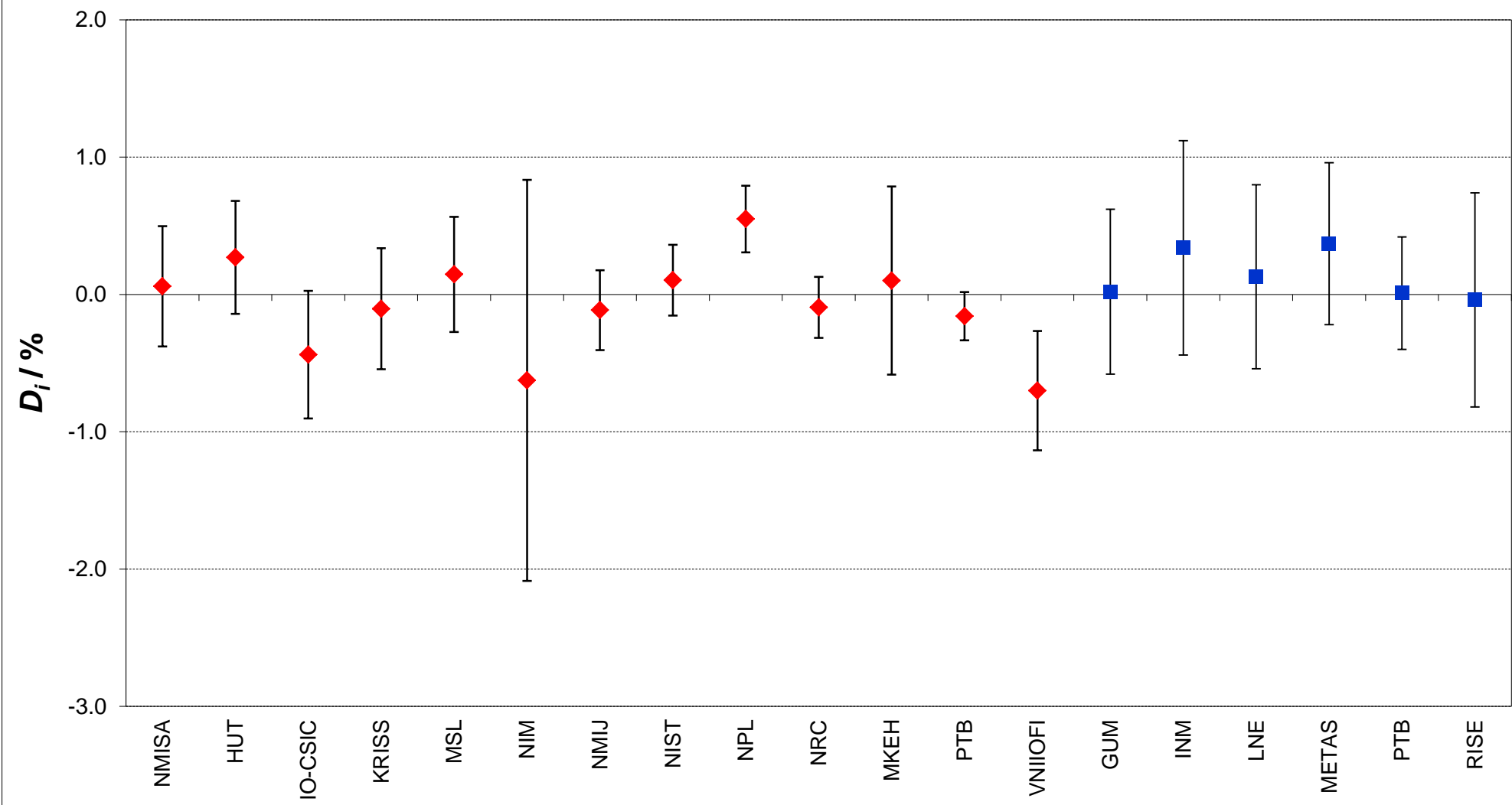
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 440 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



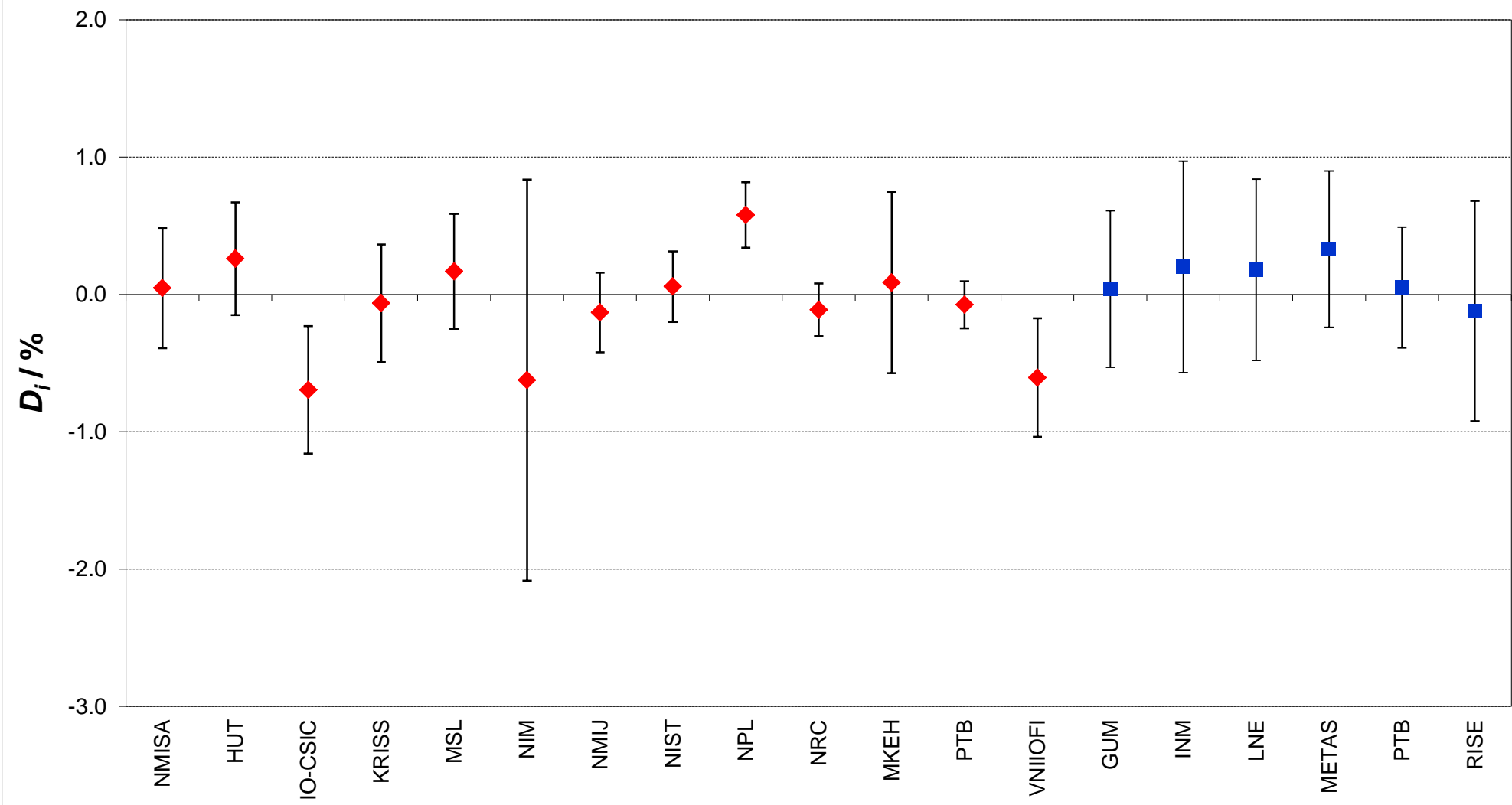
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 460 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



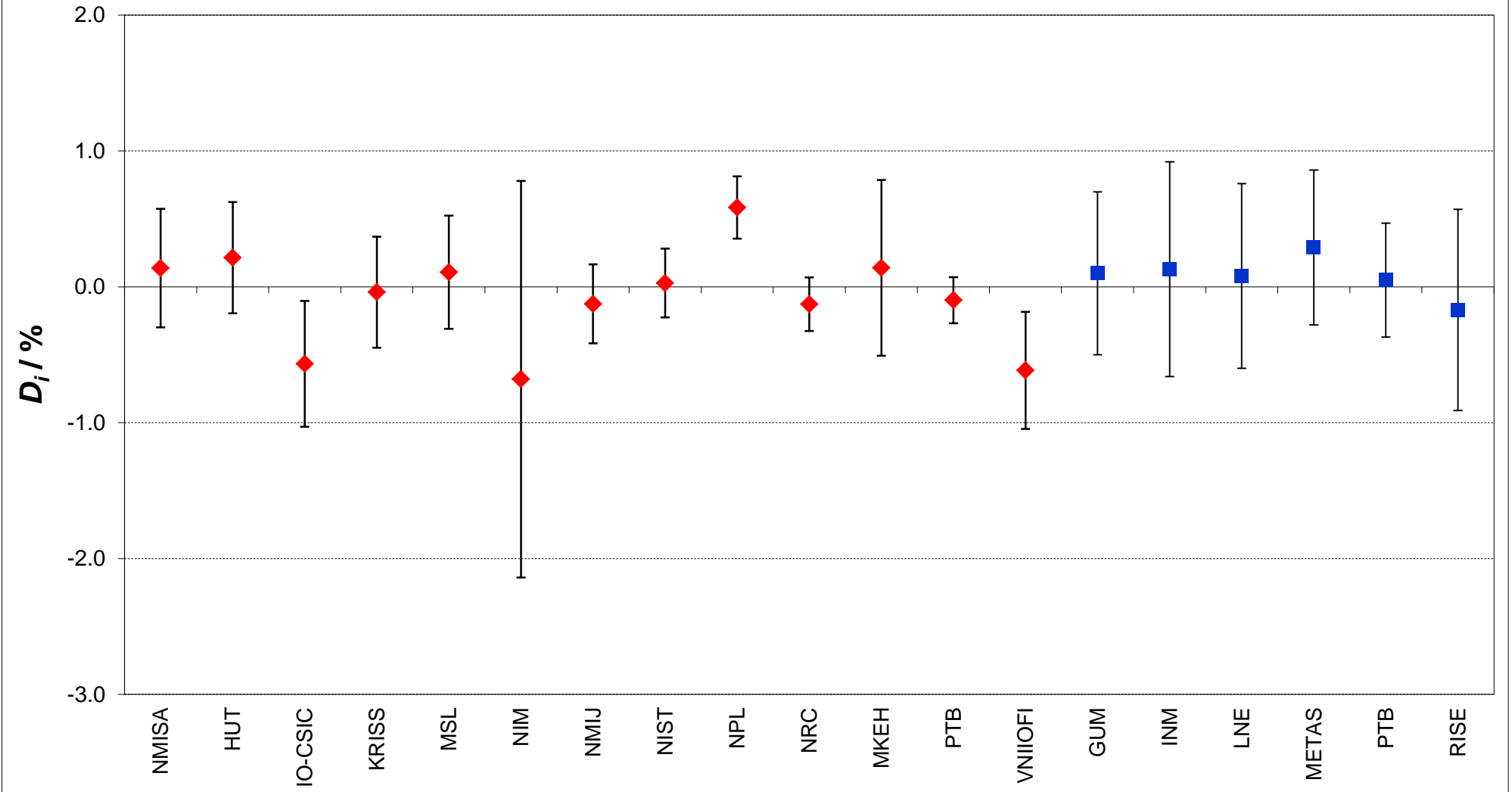
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 480 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



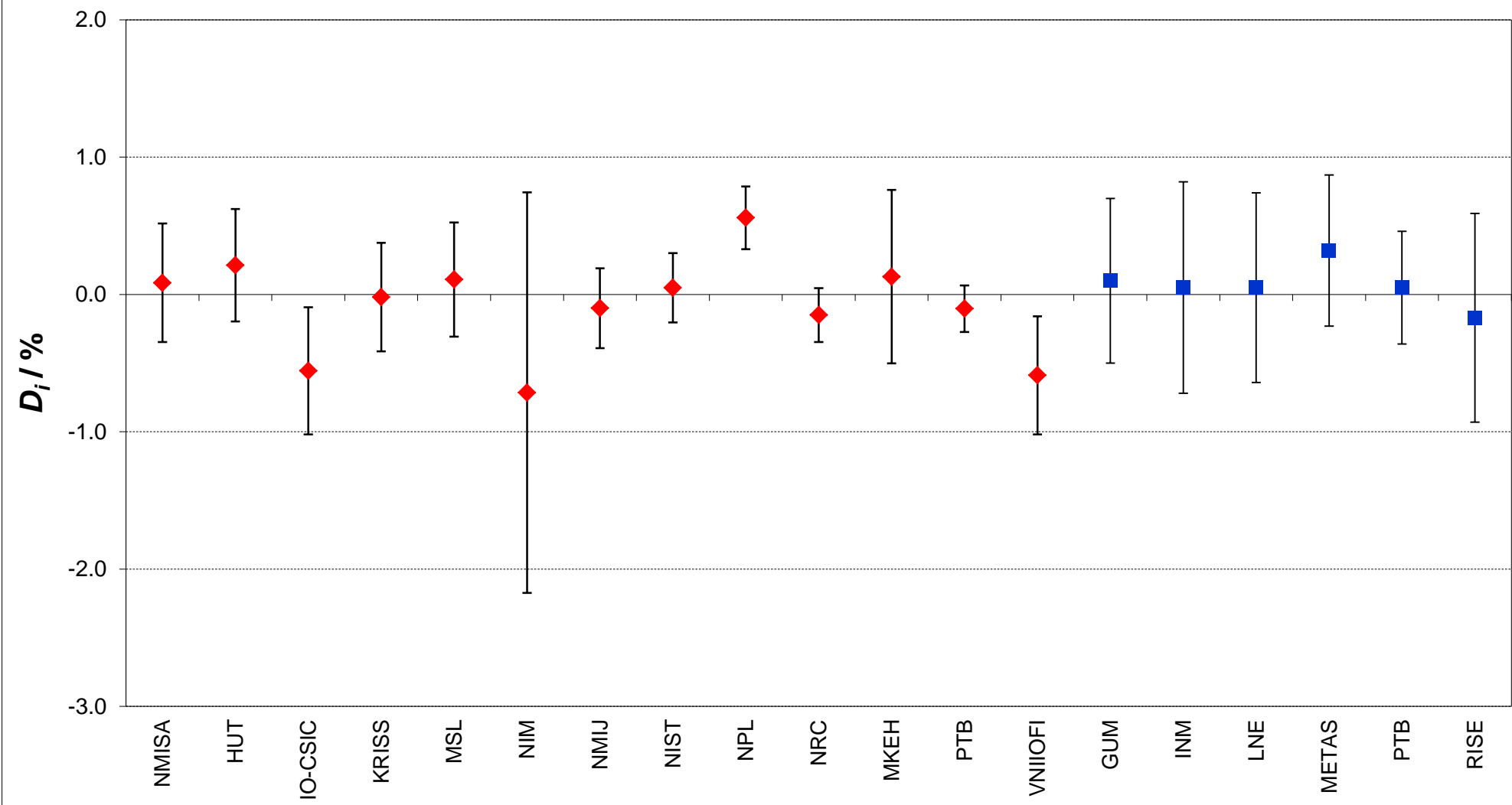
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 500 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



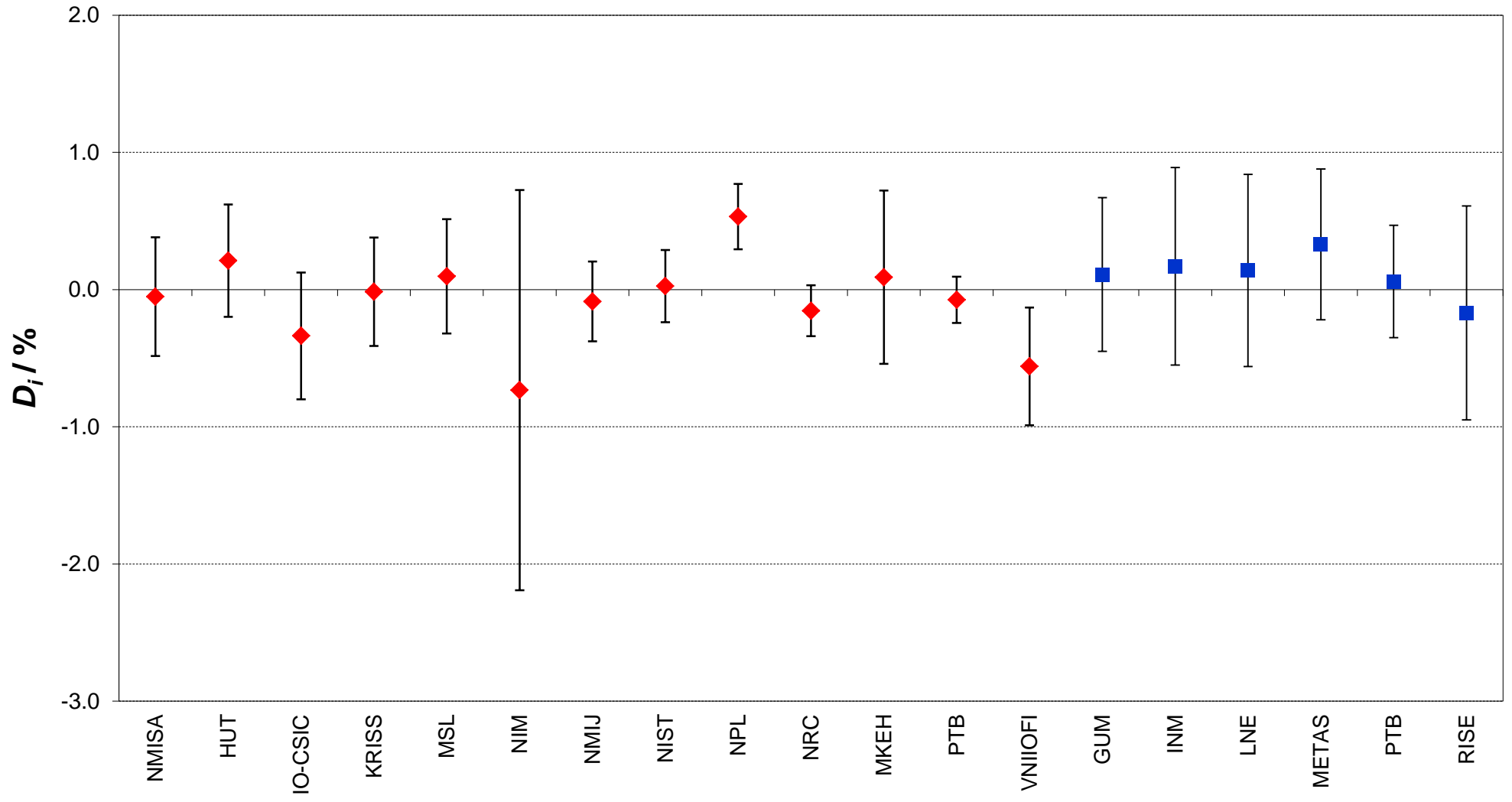
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 520 nm
Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



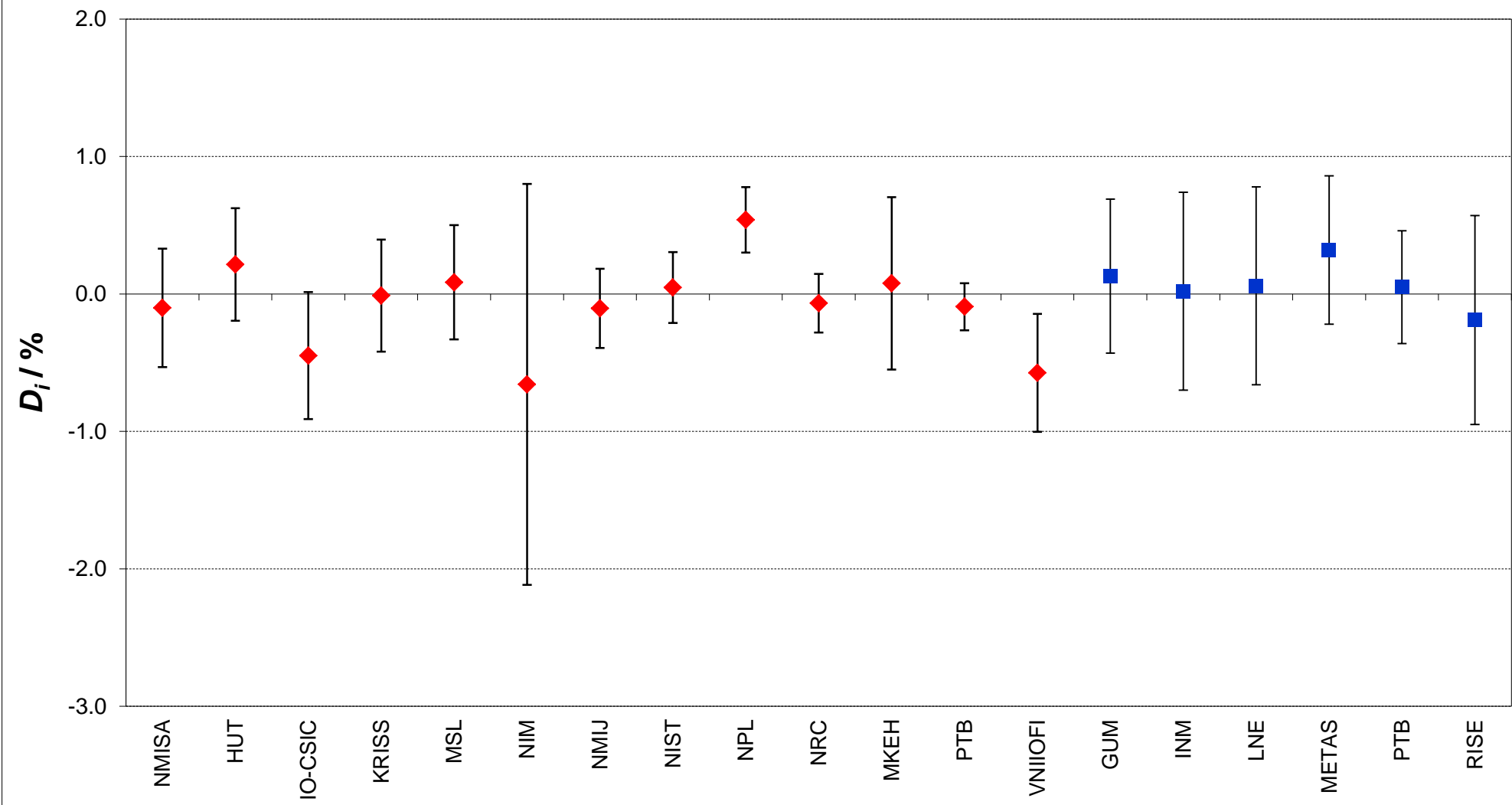
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 540 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



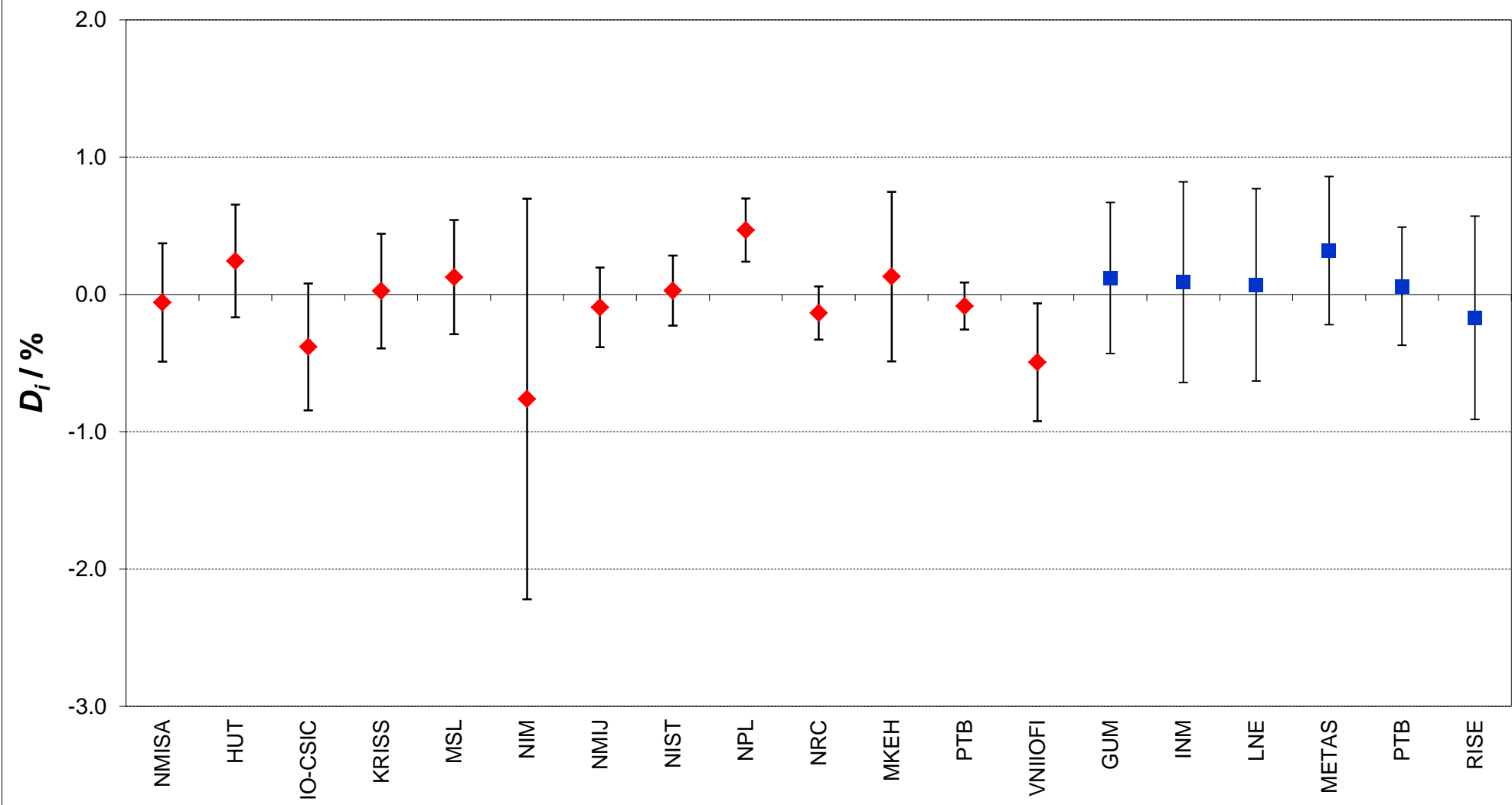
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 560 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



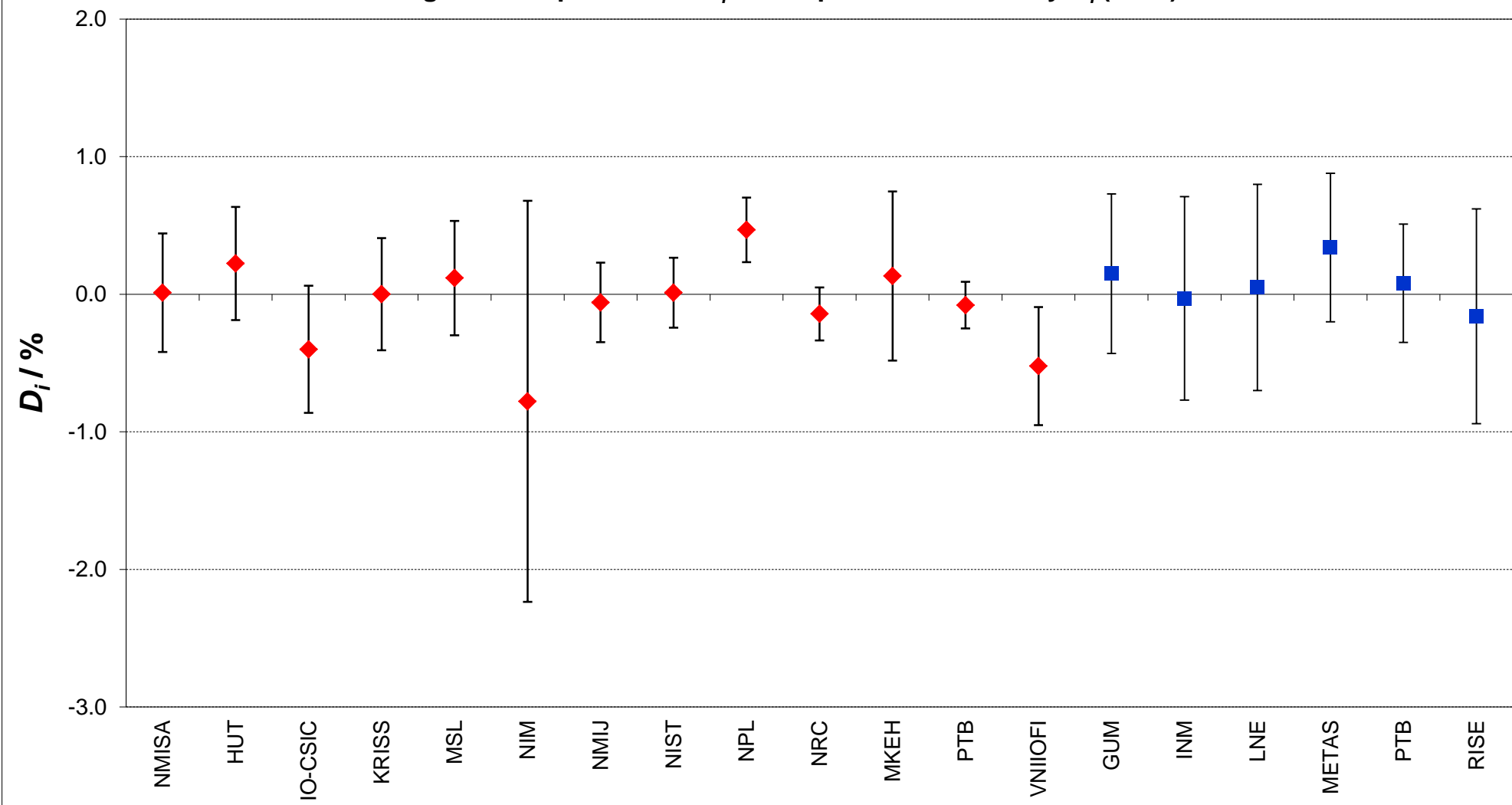
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 580 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



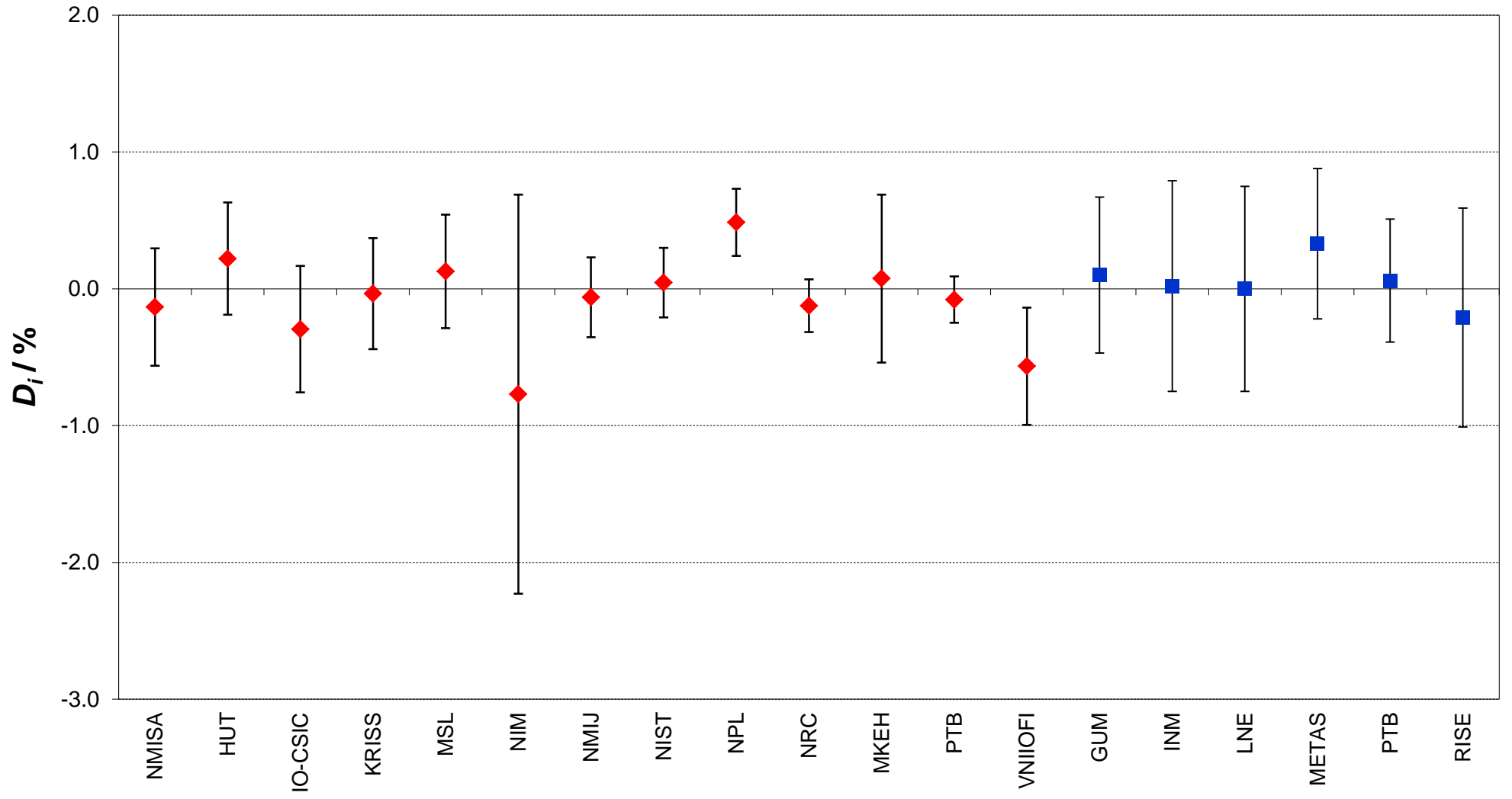
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 600 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



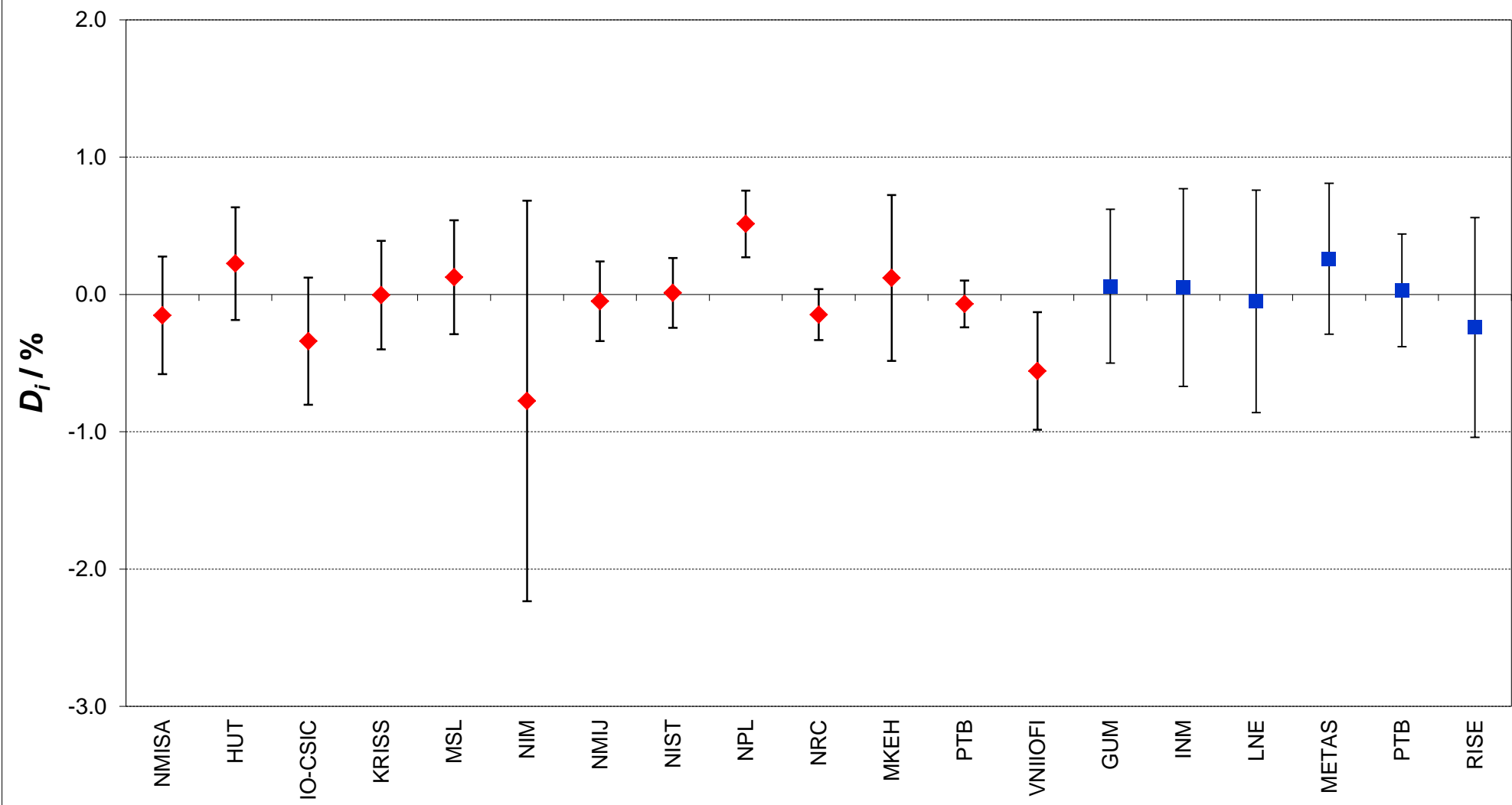
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 620 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



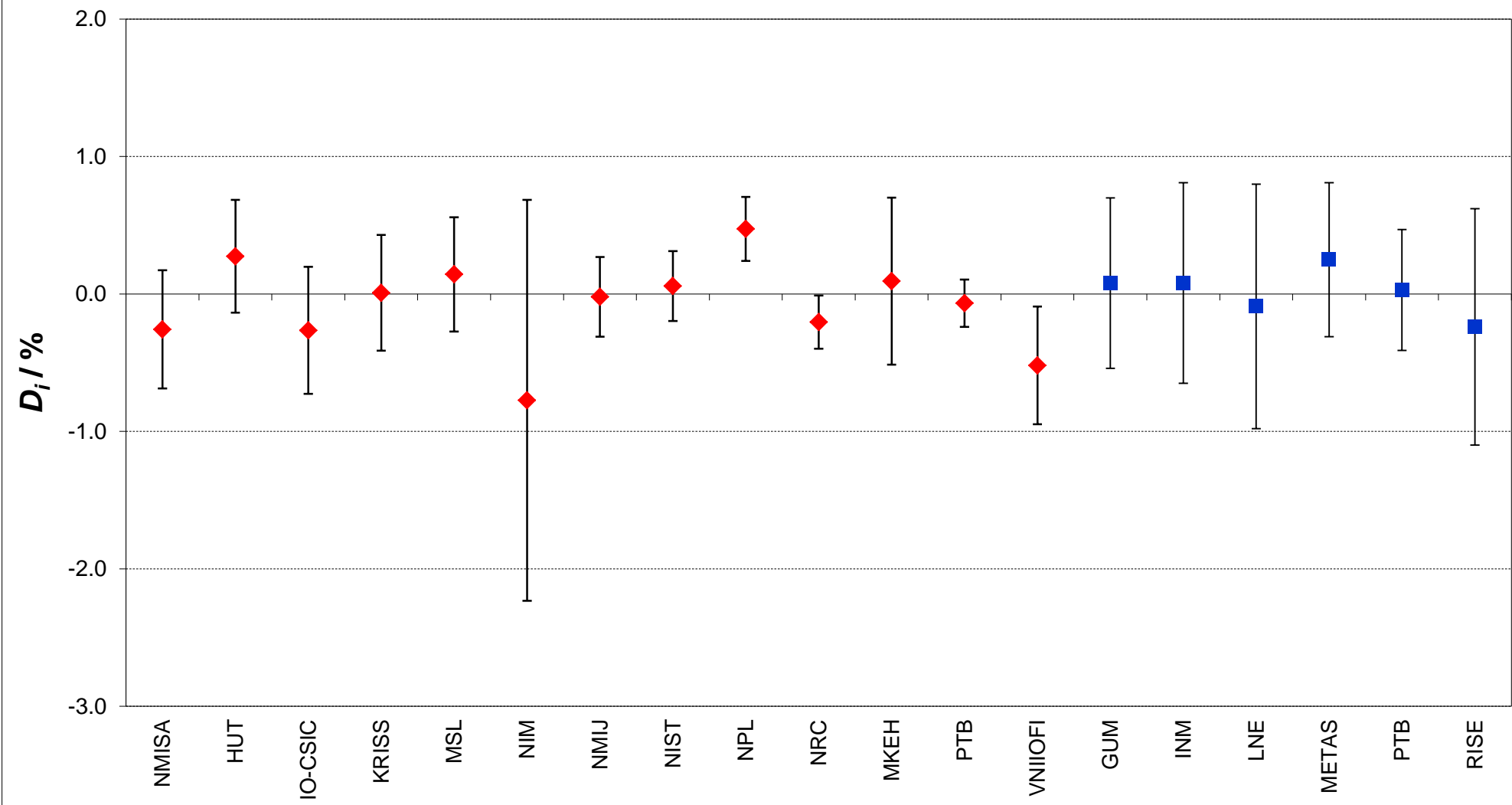
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 640 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



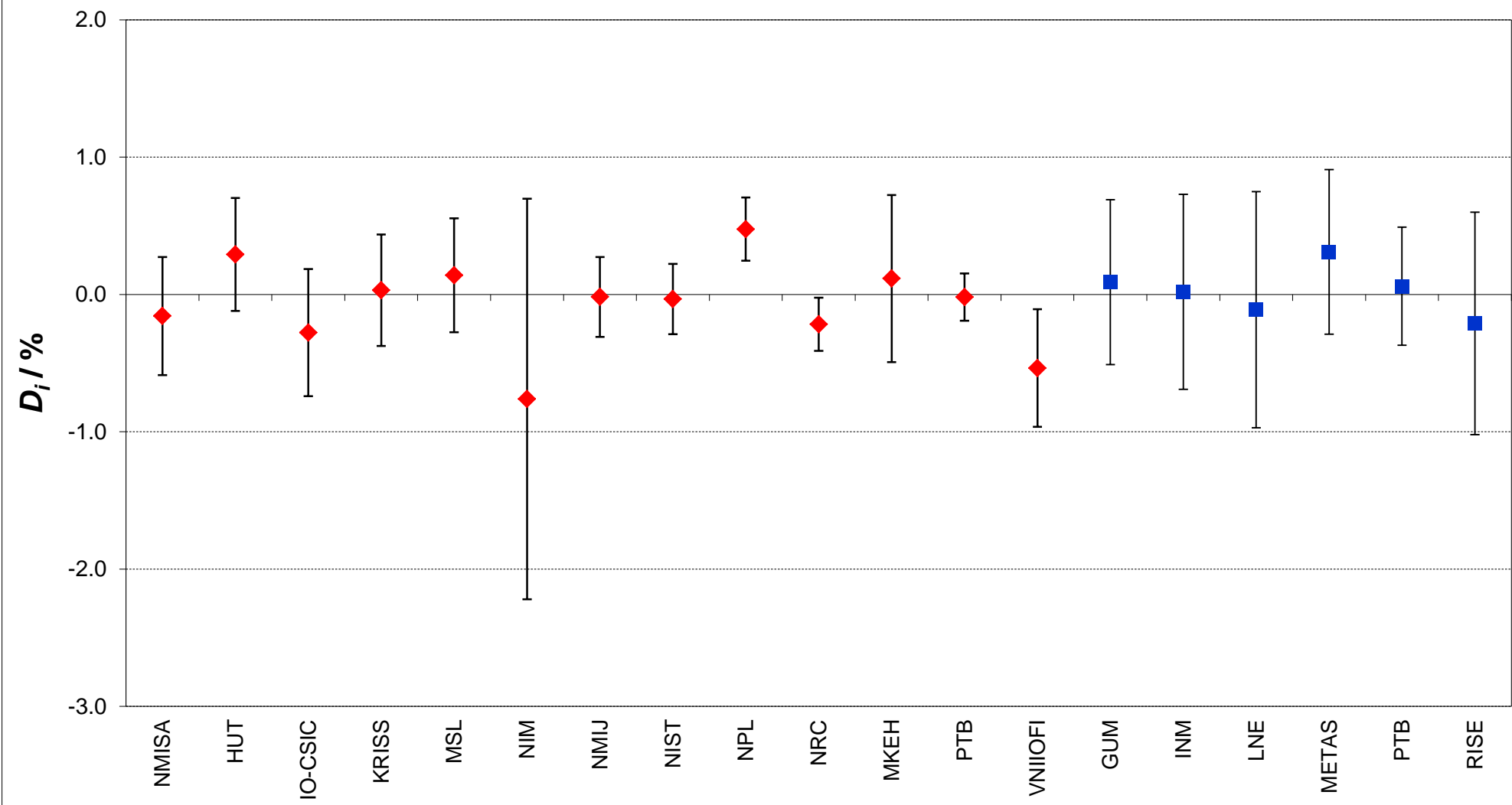
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 660 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



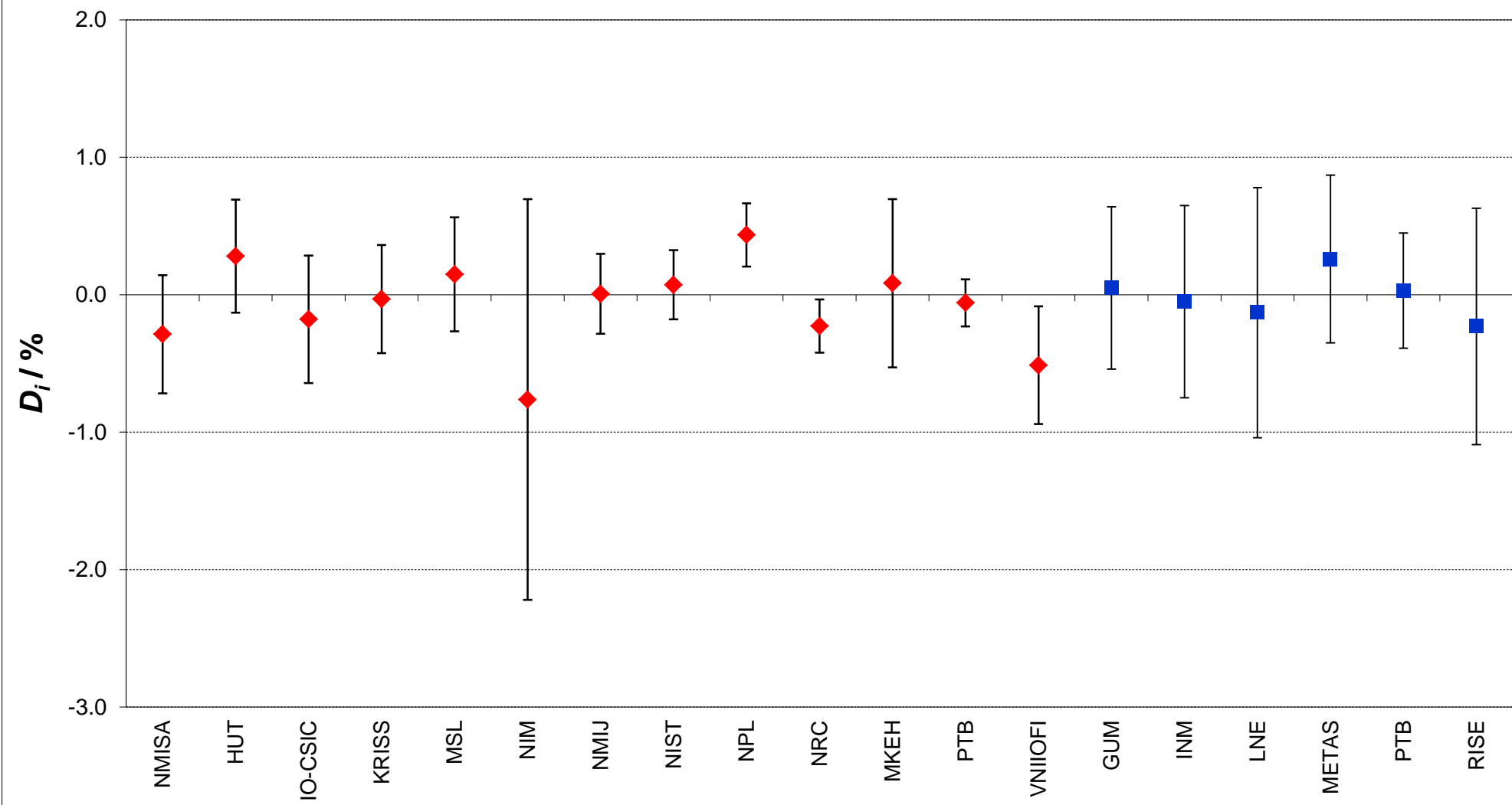
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 680 nm
 Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



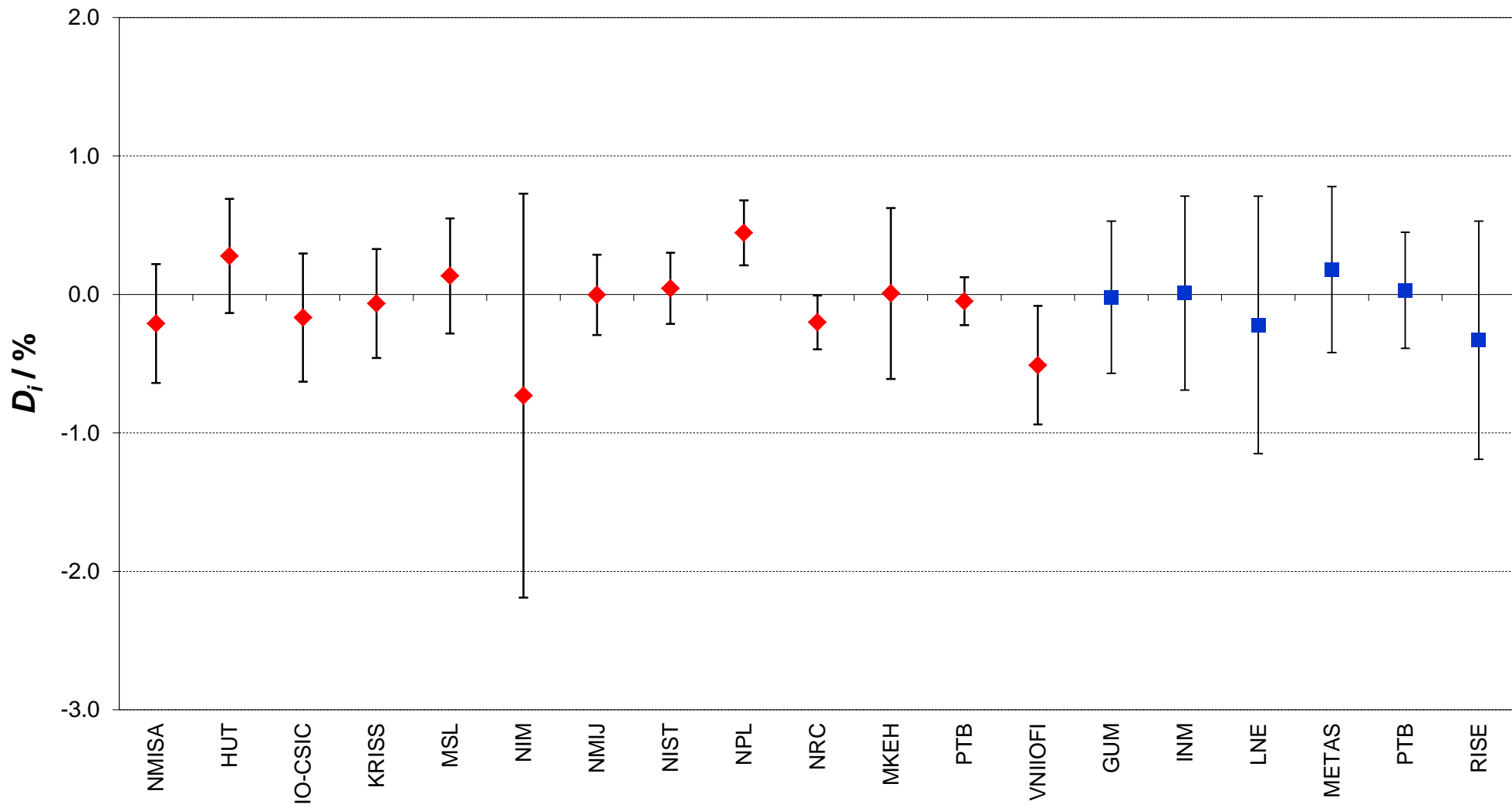
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 700 nm
 Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



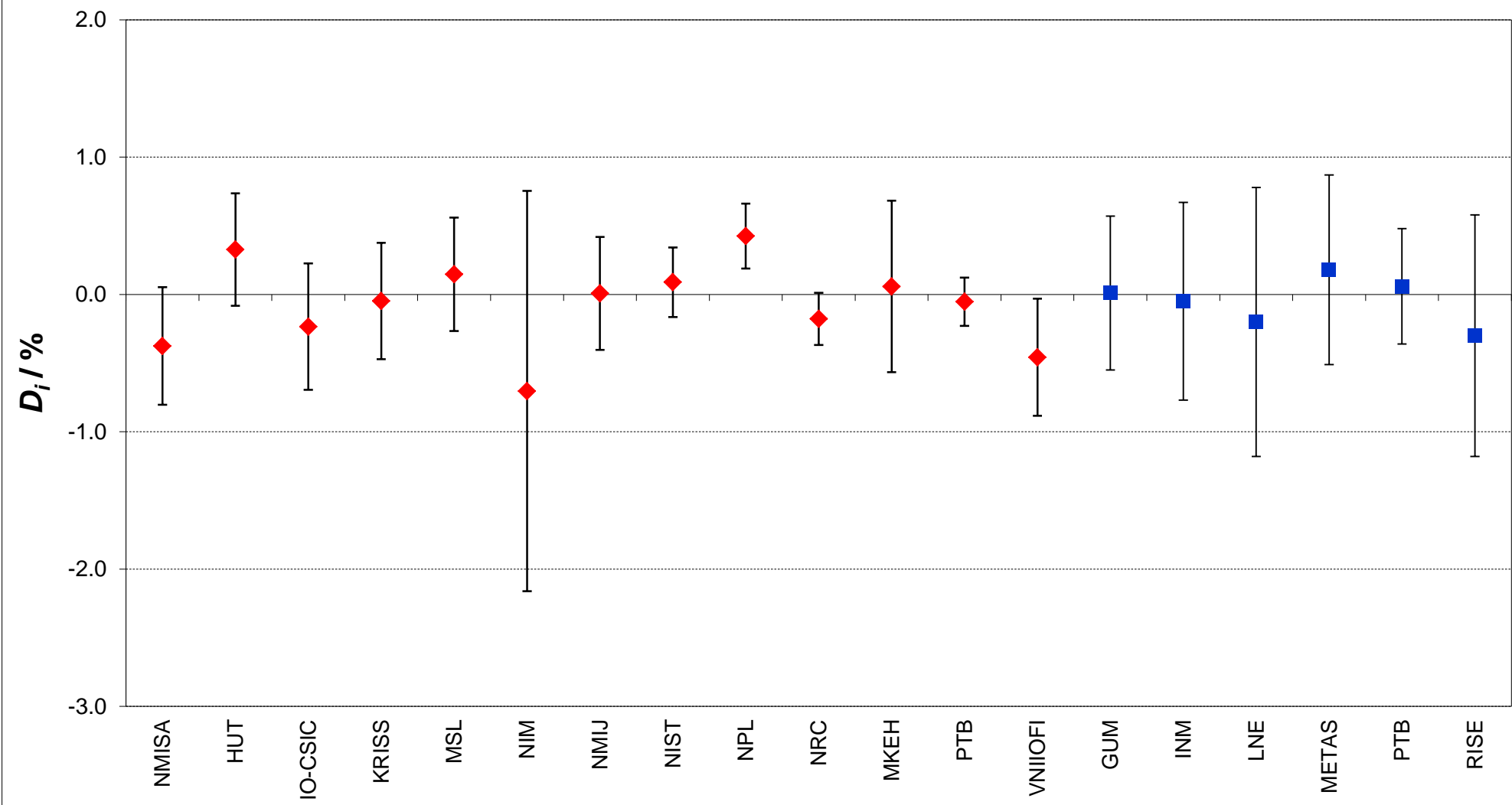
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 720 nm
 Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



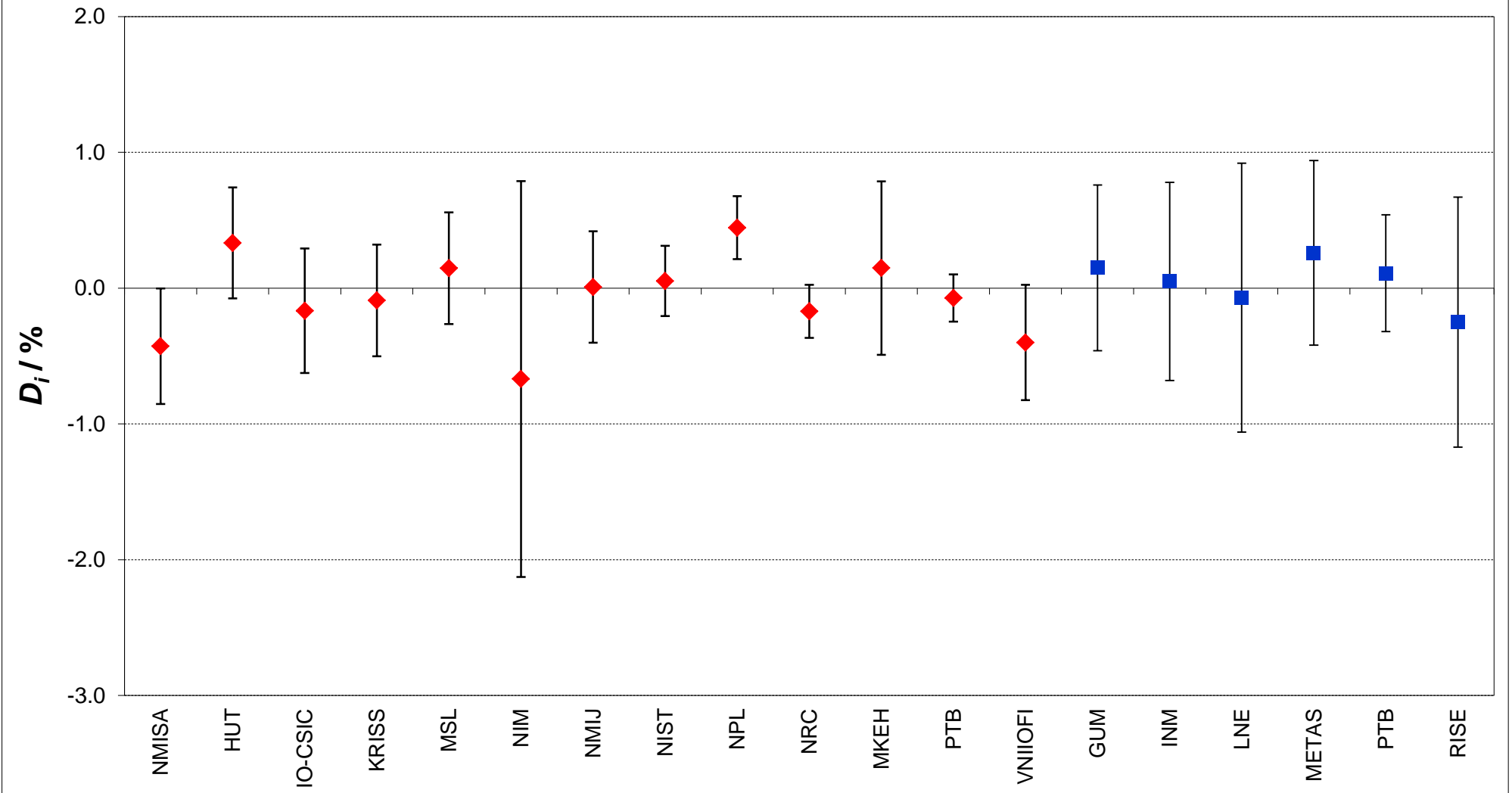
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 740 nm
Degrees of equivalence: D_i and expanded uncertainty $U_i (k = 2)$



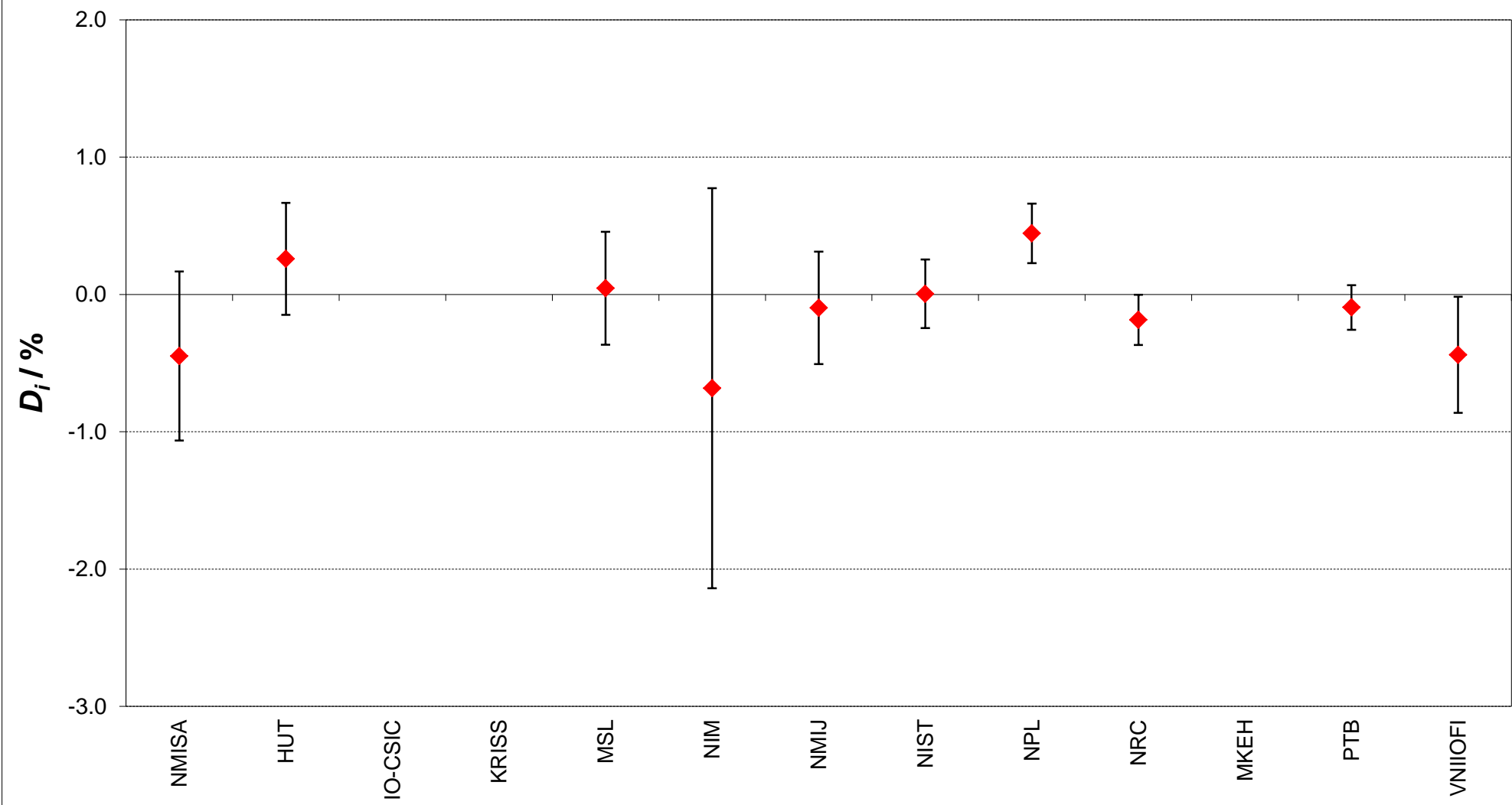
CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 760 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



CCPR-K5 and EURAMET.PR-K5 Spectral diffuse reflectance Wavelength 780 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



CCPR-K5 Spectral diffuse reflectance Wavelength 800 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)



CCPR-K5 Spectral diffuse reflectance Wavelength 820 nm
Degrees of equivalence: D_i and expanded uncertainty U_i ($k = 2$)

