Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

Key comparison CCEM.M-K1

MEASURAND : **Coil constant of a DC transfer standard**

k_i: result of measurement carried out by laboratory i of the DC coil constant

u_i: relative standard uncertainty of k_i

Lab i	k_i / (mT/A)	u_i / 10^{-6}	Date of measurement
KRISS	2.024 113	4	01-07
VNIIM	2.024 130	1.1	01-09
NMIA	2.024 87	430	01-11
UME	2.055 1	278	01-12
NPL	2.024 19	73	02-02
IEN	2.023 56	222	02-04
NIM	2.024 108	8.6	02-06
CMI	2.024 206	35	02-07
CENAM	2.026 48	62	02-10
PTB	2.024 133	2.7	01-05, 02-05, 02-12
$CENAM_{PTB}$	2.024 201	32	03-03

$CENAM_{PTB}$ measurements made at PTB with the CENAM flowing water instrument

Key comparison EUROMET.EM.M-K1

Data is available from *Metrologia*, 2001, **38**, 187-191

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

Key comparison CCEM.M-K1

Some of the participants have also measured the frequency dependence of the coil constant
and have reported their results as $Q_i(f) = k_i(f)/k_i$, where f is the frequency and k_i the coil constant obtained in DC.

MEASURAND : **Frequency dependence of the coil constant relative to DC**

u_i: relative standard uncertainty of $k_i(f)/k_i$

Lab *i*	Frequency *f* / kHz	u_i / 10^{-2}	Frequency *f* / kHz	u_i / 10^{-2}	Frequency *f* / kHz	u_i / 10^{-2}
KRISS	0.1 to 1	0.08	1.1 to 5	0.13	5.1 to 20	0.22
VNIIM	0.06 to 6.3	0.07	10 to 20	0.17		
UME	0.05 to 0.2	0.4				
NPL	0.02	0.039	0.06 to 20	0.2		
IEN	0.02 to 6	0.16	8 to 10	0.17	12 to 20	0.18 to 0.28
NIM	0.03 to 20	0.22				
CMI	0.04 to 0.88	0.03	1.22 to 4.8	0.059	7.2 to 20	0.24
PTB	0.02 to 0.99	0.04	1 to 9.9	0.08	10 to 20	0.17

Key comparison EUROMET.EM.M-K1

Data is available from *Metrologia*, 2001, **38**, 187-191

Key comparison CCEM.M-K1

The key comparison reference value, k_R, is obtained as the weighted average of the results of 6 participants (see on pages 5 and 6 of the Final Report):
k_R = 2.024 129 mT/A, with relative standard uncertainty $u_R = 5.75\ 10^{-6}$.

The degree of equivalence of each laboratory i with respect to the reference value is given by a pair of terms both expressed in relative units:
$D_i = (k_i/k_R) - 1$, and U_i, its expanded uncertainty ($k = 2$), with $U_i = 2u_i$.
Due to the fairly large value of the expanded uncertainty ($k = 2$) of the key comparison reference value ($11.5\ 10^{-6}$) with respect to the expanded uncertainty of some of the participants, u_R is not included in the U_i's calculation.
The degree of equivalence between two laboratories i and j is given by a pair of terms both expressed in relative units:
$D_{ij} = (k_i - k_j)/k_R$ and U_{ij}, its expanded uncertainty ($k = 2$), $U_{ij} = 2(u_i^2 + u_j^2)^{1/2}$.

Linking EUROMET.EM.M-K1 to CCEM.M-K1

The link is computed from the results of the common participants, CMI, NPL, and PTB, which used NMR methods and thus provided the lowest uncertainty budgets. For each of these laboratories the ratio of their results obtained in CCEM.M-K1 to those obtained in EUROMET.EM.M-K1 is calculated. The weighted mean of these ratio values provides a factor, F, used to transfer the participants' results obtained in EUROMET.EM.M-K1 to CCEM.M-K1 (see Linkage Report):
F = 1.0001861 with expanded uncertainty ($k = 2$) $U_F = 17.8\ 10^{-6}$.

The degree of equivalence of each laboratory i participant in EUROMET.EM.M-K1 only with respect to the CCEM.M-K1 reference value is given by a pair of terms both expressed in relative units:
$D_i = (Fk_i/k_R) - 1$, and U_i its expanded uncertainty ($k = 2$), $U_i = 2[u_i^2 + (U_F/2)^2]^{1/2}$.
The degree of equivalence between one laboratory i participating in EUROMET.EM.M-K1 and one laboratory j participating in CCEM.M-K1 is given by a pair of terms both expressed in relative units:
$D_{ij} = (Fk_i - k_j)/k_R$ and U_{ij}, its expanded uncertainty ($k = 2$), $U_{ij} = 2[(U_i/2)^2 + u_j^2]^{1/2}$.

These statements make it possible to extend the CCEM.M-K1 matrix of equivalence to participants in EUROMET.EM.M-K1.

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : **Frequency dependence of the coil constant relative to DC**

Key comparison CCEM.M-K1

A curve $P(f)$ is fitted by means of partial polynomial least squares adjustment on the values $Q_i(f)$ provided by all participants except UME and NIM (see page 8 and Figure 6 of the Final Report).
Interpretation of the results in terms of equivalence is carried out for four nominal frequencies: 50 Hz, 1 kHz, 5 kHz, and 20 kHz.
For each of these frequencies, the key comparison reference value is $P(f)$.
Its expanded uncertainty U_P ranges from 0.16 % at 50 Hz to 0.67 % at 20 kHz.

Frequency f	$P(f)$	U_P
50 Hz	1.0001	0.16%
1 kHz	0.9980	0.19%
5 kHz	0.9952	0.30%
20 kHz	1.0065	0.67%

At each frequency f, the degree of equivalence of laboratory i with respect to the reference value is given by a pair of terms both expressed in relative units:
$D_i = [Q_i(f)/P(f)] - 1$, and U_i, its expanded uncertainty ($k = 2$), with $U_i = 2u_i$.
Due to the fairly large value of the expanded uncertainty ($k = 2$) of the key comparison reference value with respect to the expanded uncertainty of some of the participants, it is not included in the U_i's calculation.

The degree of equivalence between two laboratories i and j is given by a pair of terms both expressed in relative units:
$D_{ij} = [Q_i(f)/Q_j(f)] - 1$ and U_{ij}, its expanded uncertainty ($k = 2$), $U_{ij} = 2(u_i^2 + u_j^2)^{1/2}$.

Linking EUROMET.EM.M-K1 to CCEM.M-K1

The link is computed from the results of the four common participants, CMI, NPL, IEN, and PTB.
For each of these laboratories the ratio of their results obtained in CCEM.M-K1 to those obtained in EUROMET.EM.M-K1 is calculated.
A transfer curve $F(f)$ is fitted by means of partial polynomial least squares adjustment on these ratio values, and is used to transfer the participants' results obtained in EUROMET.EM.M-K1 to CCEM.M-K1 (see Linkage Report).
The linkage is made for three nominal frequencies: 50 Hz, 1 kHz, and 5 kHz.

Frequency f	$F(f)$	U_F
50 Hz	1.0000	0.36%
1 kHz	0.9978	0.38%
5 kHz	0.9936	0.48%

The degree of equivalence of each laboratory i participant in EUROMET.EM.M-K1 only with respect to the CCEM.M-K1 reference value is given by a pair of terms both expressed in relative units:
$D_i = [F(f)Q_i(f)/P(f)] - 1$, and U_i, its expanded uncertainty ($k = 2$), with $U_i = 2[u_i^2 + (U_F/2)^2]^{1/2}$ (see Linkage Report).

The degree of equivalence between one laboratory i participating in EUROMET.EM.M-K1 and one laboratory j partipating in CCEM.M-K1 is given by a pair of terms both expressed in relative units:
$D_{ij} = [F(f)Q_i(f)/Q_j(f)] - 1$ and U_{ij}, its expanded uncertainty ($k = 2$), $U_{ij} = 2[(U_i/2)^2 + u_j^2]^{1/2}$.

These statements make it possible to extend the CCEM.M-K1 matrix of equivalence to participants in EUROMET.EM.M-K1.

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant of a DC transfer standard

Matrix of Equivalence (1/2)

Lab *j* ⟹

Lab *i* ⇩	D_i / 10^{-6}	U_i / 10^{-6}	KRISS D_{ij} / 10^{-6}	KRISS U_{ij} / 10^{-6}	VNIIM D_{ij} / 10^{-6}	VNIIM U_{ij} / 10^{-6}	NMIA D_{ij} / 10^{-6}	NMIA U_{ij} / 10^{-6}	UME D_{ij} / 10^{-6}	UME U_{ij} / 10^{-6}	NPL D_{ij} / 10^{-6}	NPL U_{ij} / 10^{-6}	IEN D_{ij} / 10^{-6}	IEN U_{ij} / 10^{-6}	NIM D_{ij} / 10^{-6}	NIM U_{ij} / 10^{-6}
KRISS	**-7.8**	8			**-8.6**	8.3	**-374**	860	**-15309**	556	**-38**	146	**273**	444	**2.5**	19
VNIIM	**0.8**	2.2	**8.6**	8.3			**-365**	860	**-15300**	556	**-29.4**	146	**282**	444	**11.1**	17.3
NMIA	**365**	860	**374**	860	**365**	860			**-14935**	1024	**336**	872	**647**	968	**376**	860
UME	**15000**	556	**15309**	556	**15300**	556	**14935**	1024			**15271**	575	**15582**	712	**15311**	556
NPL	**30.3**	146	**38**	146	**29.4**	146	**-336**	872	**-15271**	575			**311**	467	**40.5**	147
IEN	**-281**	444	**-273**	444	**-282**	444	**-647**	968	**-15582**	712	**-311**	467			**-271**	444
NIM	**-10.2**	17.2	**-2.5**	19	**-11.1**	17.3	**-376**	860	**-15311**	556	**-40.5**	147	**271**	444		
CMI	**38.2**	70	**45.9**	70.5	**37.3**	70	**-328**	863	**-15263**	560	**7.9**	162	**319**	449	**48.4**	72
CENAM	**1162**	124	**1169**	124	**1161**	124	**795**	869	**-14139**	570	**1131**	192	**1443**	461	**1172**	125
PTB	**2.4**	5.4	**10.2**	9.6	**1.6**	5.8	**-364**	860	**-15299**	556	**-27.9**	146	**283**	444	**12.6**	18
$CENAM_{PTB}$	**35.6**	64	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-	**-**	-
MIRS/FE-LMK	**-16.2**	131	**-8.4**	131	**-17**	131	**-381**	870	**-15016**	571	**-46.5**	196	**265**	463	**-6**	132
BNM-LCIE	**3600**	5000	**3608**	5000	**3599**	5000	**3235**	5073	**-11400**	5031	**3570**	5002	**3881**	5020	**3610**	5000
NMi-VSL	**-1630**	3000	**-1622**	3000	**-1631**	3000	**-1995**	3121	**-16630**	3051	**-1660**	3004	**-1349**	3033	**-1620**	3000

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : **Coil constant of a DC transfer standard**

Matrix of Equivalence (2/2)

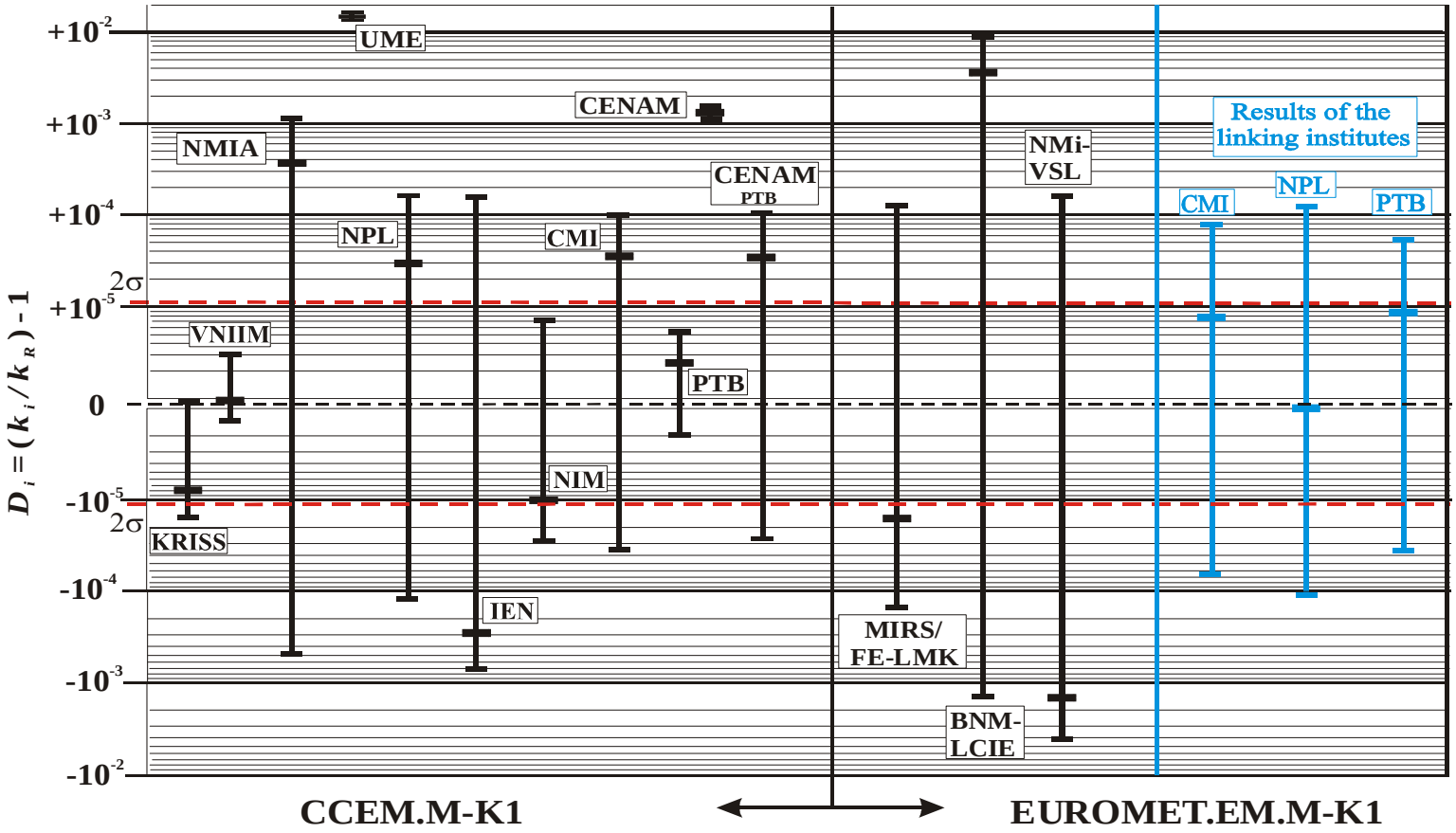
Lab *j* ⇒

Lab *i* ⇓

Lab *i*	D_i / 10^{-6}	U_i / 10^{-6}	CMI D_{ij} / 10^{-6}	CMI U_{ij} / 10^{-6}	CENAM D_{ij} / 10^{-6}	CENAM U_{ij} / 10^{-6}	PTB D_{ij} / 10^{-6}	PTB U_{ij} / 10^{-6}	$CENAM_{PTB}$ D_{ij} / 10^{-6}	$CENAM_{PTB}$ U_{ij} / 10^{-6}	MIRS/FE-LMK D_{ij} / 10^{-6}	MIRS/FE-LMK U_{ij} / 10^{-6}	BNM-LCIE D_{ij} / 10^{-6}	BNM-LCIE U_{ij} / 10^{-6}	NMi-VSL D_{ij} / 10^{-6}	NMi-VSL U_{ij} / 10^{-6}
KRISS	**-7.8**	8	**-45.9**	70.5	**-1169**	124	**-10.2**	9.6	**-**	**-**	**8.4**	131	**-3608**	5000	**1622**	3000
VNIIM	**0.8**	2.2	**-37.3**	70	**-1161**	124	**-1.6**	5.8	**-**	**-**	**17**	131	**-3599**	5000	**1631**	3000
NMIA	**365**	860	**328**	863	**-795**	869	**364**	860	**-**	**-**	**381**	870	**-3235**	5073	**1995**	3121
UME	**15000**	556	**15263**	560	**14139**	570	**15299**	556	**-**	**-**	**15016**	571	**11400**	5031	**16630**	3051
NPL	**30.3**	146	**-7.9**	162	**-1131**	192	**27.9**	146	**-**	**-**	**46.5**	196	**-3570**	5002	**1660**	3004
IEN	**-281**	444	**-319**	449	**-1443**	461	**-283**	444	**-**	**-**	**-265**	463	**-3881**	5020	**1349**	3033
NIM	**-10.2**	17.2	**-48.4**	72	**-1172**	125	**-12.6**	18	**-**	**-**	**6**	132	**-3610**	5000	**1620**	3000
CMI	**38.2**	70			**-1123**	142	**35.8**	70	**-**	**-**	**54**	149	**-3562**	5000	**1668**	3001
CENAM	**1162**	124	**1123**	142			**1159**	124	**-**	**-**	**1178**	180	**-2438**	5001	**2792**	3003
PTB	**2.4**	5.4	**-35.8**	70	**-1159**	124			**-**	**-**	**19**	131	**-3598**	5000	**1632**	3000
$CENAM_{PTB}$	**35.6**	64	**-**	-	**-**	-	**-**	-			-	**-**	-	**-**	-	**-**
MIRS/FE-LMK	**-16.2**	131	**-54**	149	**-1178**	180	**-19**	131	**-**	**-**			**-3616**	5002	**1614**	3003
BNM-LCIE	**3600**	5000	**3562**	5000	**2438**	5001	**3598**	5000	**-**	**-**	**3616**	5002			**5230**	5831
NMi-VSL	**-1630**	3000	**-1668**	3001	**-2792**	3003	**-1632**	3000	**-**	**-**	**-1614**	3003	**-5230**	5831		

CCEM.M-K1 and EUROMET.EM.M-K1

Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2), for DC measurements



The "2σ" horizontal lines correspond to the expanded uncertainty (k = 2) of the key comparison reference value

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 50 Hz

Matrix of Equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	KRISS		VNIIM		UME		NPL		IEN		NIM		CMI	
			D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}
KRISS	**-0.032**	0.16			**-0.01**	0.21	**-0.068**	0.82	**-0.06**	0.43	**-0.06**	0.36	**-0.14**	0.47	**-0.03**	0.17
VNIIM	**-0.022**	0.14	**0.01**	0.21			**-0.058**	0.81	**-0.05**	0.43	**-0.05**	0.35	**-0.13**	0.46	**-0.02**	0.15
UME	**0.036**	0.8	**0.068**	0.82	**0.058**	0.81			**0.008**	0.89	**0.008**	0.86	**-0.072**	0.91	**0.038**	0.8
NPL	**0.028**	0.4	**0.06**	0.43	**0.05**	0.43	**-0.008**	0.89			**0**	0.51	**-0.08**	0.59	**0.03**	0.4
IEN	**0.028**	0.32	**0.06**	0.36	**0.05**	0.35	**-0.008**	0.86	**0**	0.51			**-0.08**	0.54	**0.03**	0.33
NIM	**0.108**	0.44	**0.14**	0.47	**0.13**	0.46	**0.072**	0.91	**0.08**	0.59	**0.08**	0.54			**0.11**	0.44
CMI	**0**	0.06	**0.03**	0.17	**0.02**	0.15	**-0.038**	0.8	**-0.03**	0.4	**-0.03**	0.33	**-0.11**	0.44		
PTB	**0.016**	0.08	**0.016**	0.18	**0.006**	0.18	**-0.052**	0.8	**-0.044**	0.41	**-0.044**	0.33	**-0.124**	0.45	**-0.014**	0.1
NMi-VSL	**-0.03**	0.41	**0.002**	0.44	**-0.008**	0.433	**-0.066**	0.899	**-0.058**	0.573	**-0.058**	0.52	**-0.138**	0.601	**-0.03**	0.414
MIRS/FE-LMK	**0**	0.39	**0.032**	0.422	**0.022**	0.414	**-0.036**	0.89	**-0.028**	0.559	**-0.028**	0.504	**-0.108**	0.588	**0**	0.395
STUK	**0.22**	1.84	**0.252**	1.847	**0.242**	1.845	**0.184**	2.006	**0.192**	1.883	**0.192**	1.868	**0.112**	1.892	**0.22**	1.841

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 50 Hz

Matrix of Equivalence (2/2)

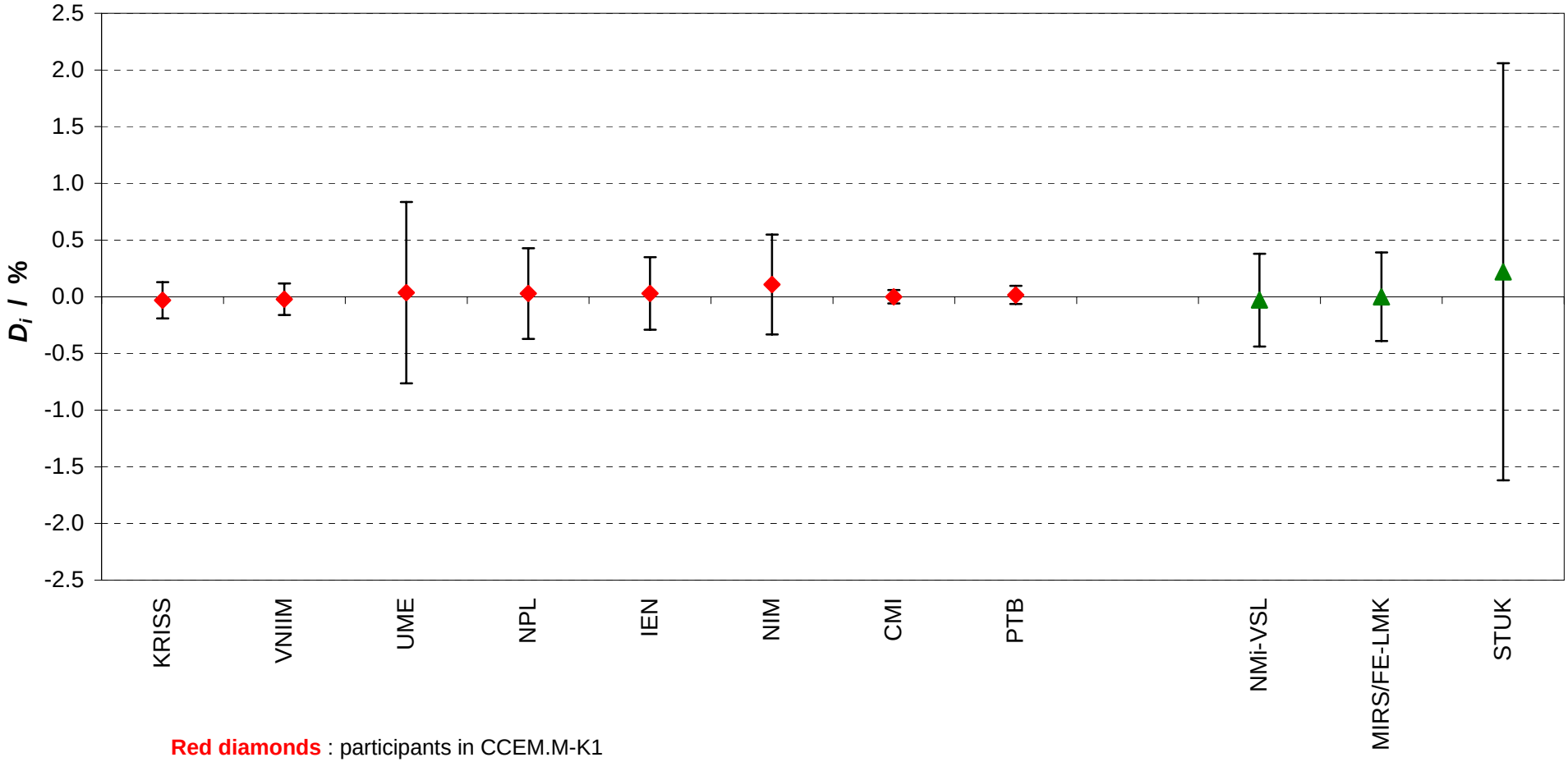
Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	PTB D_{ij} / 10^{-2}	PTB U_{ij} / 10^{-2}	NMi-VSL D_{ij} / 10^{-2}	NMi-VSL U_{ij} / 10^{-2}	MIRS/FE-LMK D_{ij} / 10^{-2}	MIRS/FE-LMK U_{ij} / 10^{-2}	STUK D_{ij} / 10^{-2}	STUK U_{ij} / 10^{-2}
KRISS	**-0.032**	0.16	**-0.016**	0.18	**-0.002**	0.44	**-0.032**	0.422	**-0.252**	1.847
VNIIM	**-0.022**	0.14	**-0.006**	0.18	**0.008**	0.433	**-0.022**	0.414	**-0.242**	1.845
UME	**0.036**	0.8	**0.052**	0.8	**0.066**	0.899	**0.036**	0.89	**-0.184**	2.006
NPL	**0.028**	0.4	**0.044**	0.41	**0.058**	0.573	**0.028**	0.559	**-0.192**	1.883
IEN	**0.028**	0.32	**0.044**	0.33	**0.058**	0.52	**0.028**	0.504	**-0.192**	1.868
NIM	**0.108**	0.44	**0.124**	0.45	**0.138**	0.601	**0.108**	0.588	**-0.112**	1.892
CMI	**0**	0.06	**0.014**	0.1	**0.03**	0.414	**0**	0.395	**-0.22**	1.841
PTB	**0.016**	0.08			**0.046**	0.418	**0.016**	0.398	**-0.204**	1.842
NMi-VSL	**-0.03**	0.41	**-0.046**	0.418			**-0.03**	0.566	**-0.25**	1.885
MIRS/FE-LMK	**0**	0.39	**-0.016**	0.398	**0.03**	0.566			**-0.22**	1.881
STUK	**0.22**	1.84	**0.204**	1.842	**0.25**	1.885	**0.22**	1.881		

CCEM.M-K1 and EUROMET.EM.M-K1

Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2), for frequency 50 Hz



Red diamonds : participants in CCEM.M-K1
Green triangles : participants in EUROMET.EM.M-K1 only

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 1 kHz

Matrix of Equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	KRISS		VNIIM		NPL		IEN		NIM		CMI		PTB	
			D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}
KRISS	**0.036**	0.16			**0.04**	0.21	**0.146**	0.43	**-0.01**	0.36	**-0.24**	0.47	**0.04**	0.17	**0.04**	0.18
VNIIM	**-0.004**	0.14	**-0.04**	0.21			**0.11**	0.42	**-0.05**	0.35	**-0.28**	0.46	**0**	0.15	**0**	0.16
NPL	**-0.11**	0.4	**-0.146**	0.43	**-0.11**	0.42			**-0.156**	0.51	**-0.386**	0.59	**-0.1**	0.4	**-0.1**	0.41
IEN	**0.046**	0.32	**0.01**	0.36	**0.05**	0.35	**0.156**	0.51			**-0.23**	0.54	**0.05**	0.33	**0.05**	0.33
NIM	**0.276**	0.44	**0.24**	0.47	**0.28**	0.46	**0.386**	0.59	**0.23**	0.54			**0.28**	0.44	**0.28**	0.45
CMI	**-0.006**	0.06	**-0.04**	0.17	**0**	0.15	**0.1**	0.4	**-0.05**	0.33	**-0.28**	0.44			**0**	0.1
PTB	**-0.006**	0.08	**-0.04**	0.18	**0**	0.16	**0.1**	0.41	**-0.05**	0.33	**-0.28**	0.45	**0**	0.1		
NMi-VSL	**-0.22**	0.43	**-0.26**	0.46	**-0.22**	0.45	**-0.11**	0.59	**-0.27**	0.54	**-0.50**	0.62	**-0.21**	0.43	**-0.21**	0.44
MIRS/FE-LMK	**-0.03**	0.41	**-0.07**	0.44	**-0.03**	0.43	**0.08**	0.57	**-0.08**	0.52	**-0.31**	0.60	**-0.02**	0.41	**-0.02**	0.42

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 1 kHz

Matrix of Equivalence (2/2)

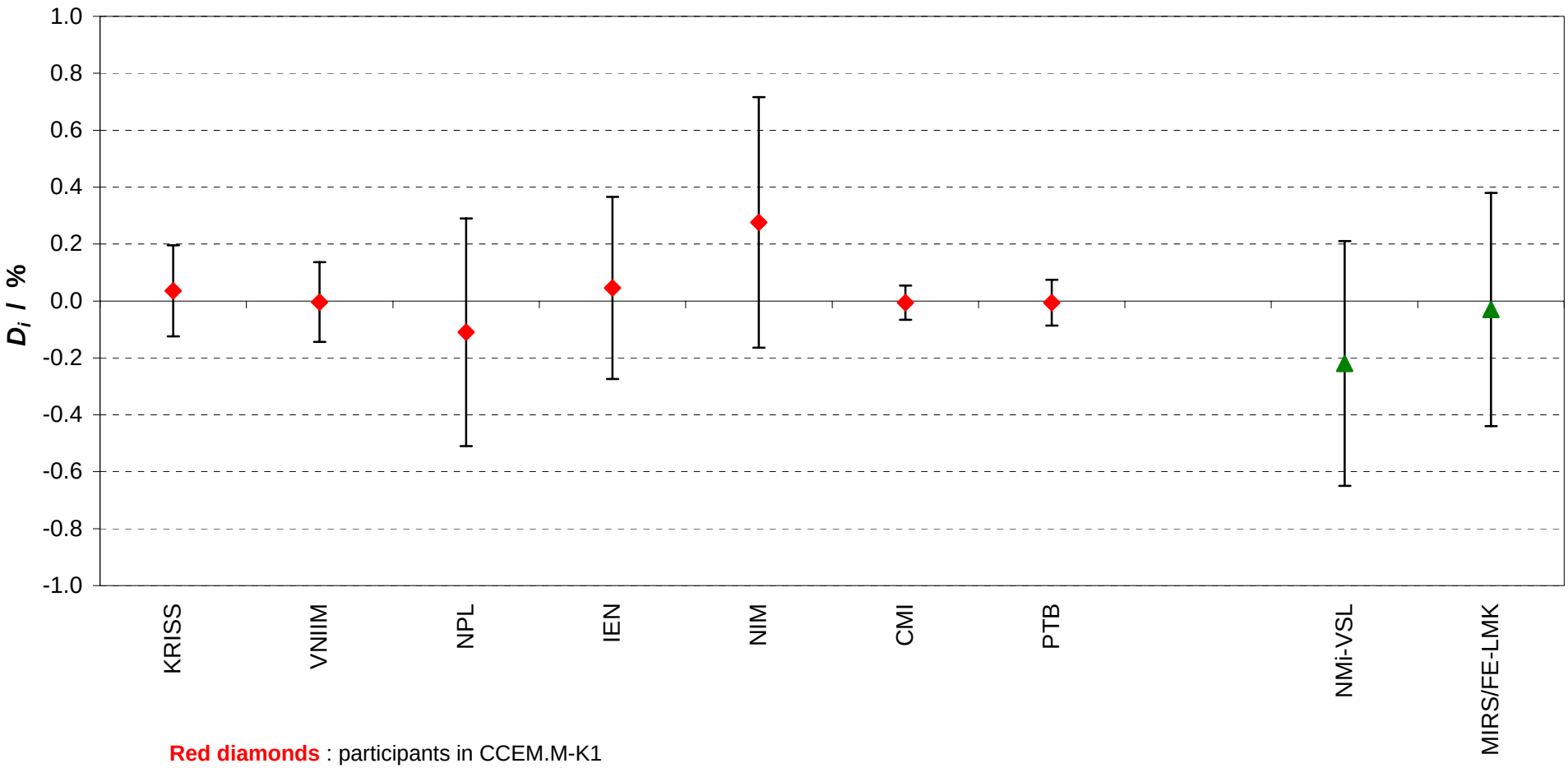
Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	NMi-VSL D_{ij} / 10^{-2}	NMi-VSL U_{ij} / 10^{-2}	MIRS/FE-LMK D_{ij} / 10^{-2}	MIRS/FE-LMK U_{ij} / 10^{-2}
KRISS	**0.036**	0.16	**0.26**	0.46	**0.07**	0.44
VNIIM	**-0.004**	0.14	**0.22**	0.45	**0.03**	0.43
NPL	**-0.11**	0.4	**0.11**	0.59	**-0.08**	0.57
IEN	**0.046**	0.32	**0.27**	0.54	**0.08**	0.52
NIM	**0.276**	0.44	**0.50**	0.62	**0.31**	0.60
CMI	**-0.006**	0.06	**0.21**	0.43	**0.02**	0.41
PTB	**-0.006**	0.08	**0.21**	0.44	**0.02**	0.42
NMi-VSL	**-0.22**	0.43			**-0.19**	0.59
MIRS/FE-LMK	**-0.03**	0.41	**0.19**	0.59		

CCEM.M-K1 and EUROMET.EM.M-K1

Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2), for frequency 1 kHz



Red diamonds : participants in CCEM.M-K1
Green triangles : participants in EUROMET.EM.M-K1 only

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 5 kHz

Matrix of Equivalence (1/2)

Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	KRISS		VNIIM		NPL		IEN		NIM		CMI		PTB	
			D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}
KRISS	**0.02**	0.26			**0.01**	0.295	**0.14**	0.485	**-0.04**	0.412	**-0.256**	0.511	**-0.06**	0.286	**0.025**	0.305
VNIIM	**0.01**	0.14	**-0.01**	0.295			**0.13**	0.433	**-0.05**	0.349	**-0.266**	0.462	**-0.07**	0.184	**0.015**	0.213
NPL	**-0.12**	0.41	**-0.14**	0.485	**-0.13**	0.433			**-0.18**	0.52	**-0.396**	0.601	**-0.200**	0.427	**-0.115**	0.440
IEN	**0.06**	0.32	**0.04**	0.412	**0.05**	0.349	**0.18**	0.52			**-0.216**	0.544	**-0.02**	0.342	**0.065**	0.358
NIM	**0.276**	0.44	**0.256**	0.511	**0.266**	0.462	**0.396**	0.601	**0.216**	0.544			**0.196**	0.456	**0.281**	0.468
CMI	**0.08**	0.12	**0.06**	0.286	**0.07**	0.184	**0.200**	0.427	**0.02**	0.342	**-0.196**	0.456			**0.085**	0.20
PTB	**-0.005**	0.16	**-0.025**	0.305	**-0.015**	0.213	**0.115**	0.440	**-0.065**	0.358	**-0.281**	0.468	**-0.085**	0.20		
NMi-VSL	**-0.12**	0.52	**-0.14**	0.58	**-0.13**	0.54	**0.00**	0.66	**-0.18**	0.61	**-0.40**	0.68	**-0.20**	0.53	**-0.12**	0.54
MIRS/FE-LMK	**-0.04**	0.58	**-0.06**	0.64	**-0.05**	0.60	**0.08**	0.71	**-0.10**	0.66	**-0.32**	0.73	**-0.12**	0.59	**-0.04**	0.60

Key comparisons CCEM.M-K1 and EUROMET.EM.M-K1

MEASURAND : Coil constant at a frequency of 5 kHz

Matrix of Equivalence (2/2)

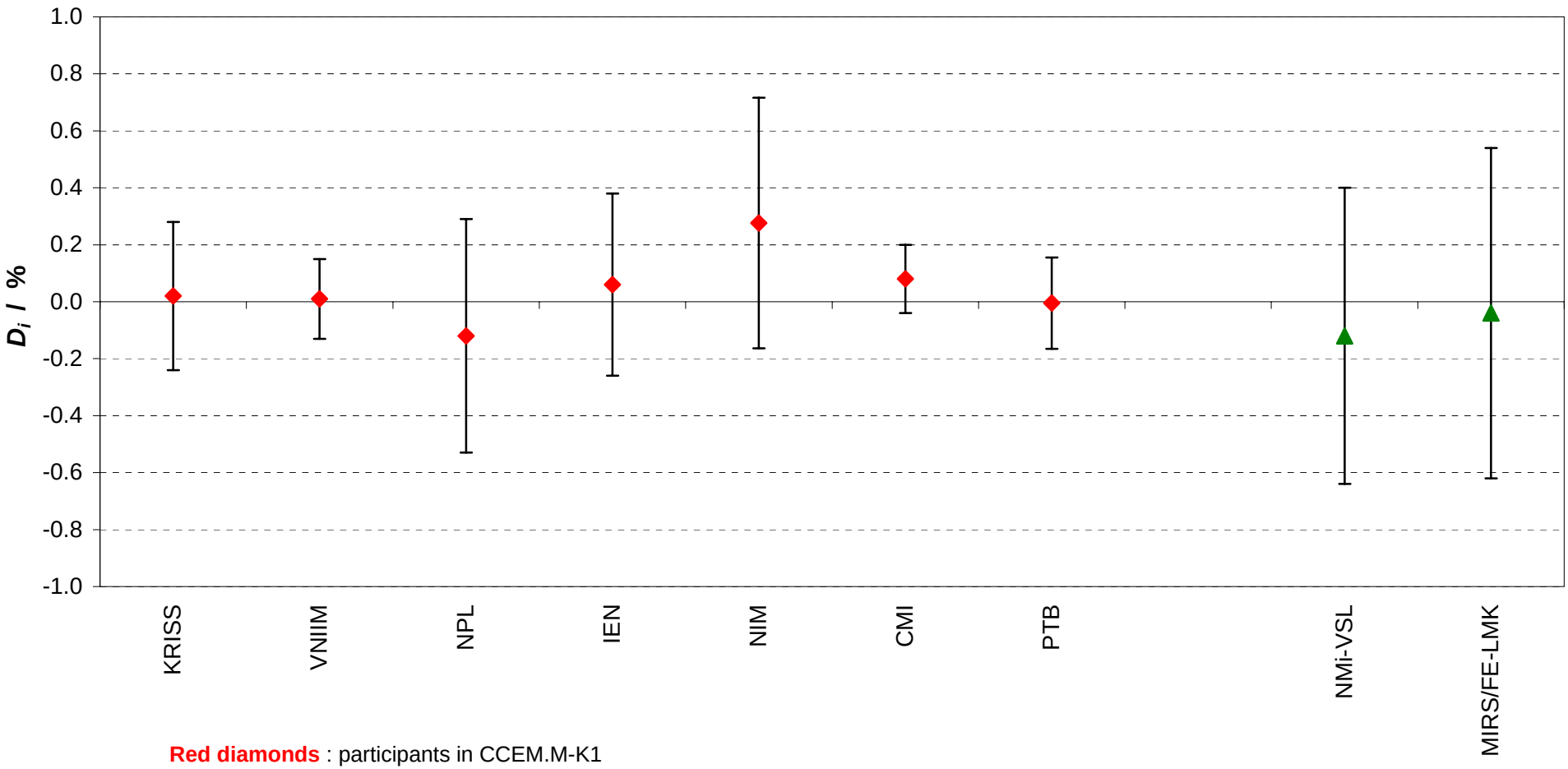
Lab *j* ⟹

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	NMi-VSL D_{ij} / 10^{-2}	NMi-VSL U_{ij} / 10^{-2}	MIRS/FE-LMK D_{ij} / 10^{-2}	MIRS/FE-LMK U_{ij} / 10^{-2}
KRISS	**0.02**	0.26	**0.14**	0.58	**0.06**	0.64
VNIIM	**0.01**	0.14	**0.13**	0.54	**0.05**	0.60
NPL	**-0.12**	0.41	**0.00**	0.66	**-0.08**	0.71
IEN	**0.06**	0.32	**0.18**	0.61	**0.10**	0.66
NIM	**0.276**	0.44	**0.40**	0.68	**0.32**	0.73
CMI	**0.08**	0.12	**0.20**	0.53	**0.12**	0.59
PTB	**-0.005**	0.16	**0.12**	0.54	**0.04**	0.60
NMi-VSL	**-0.12**	0.52			**-0.08**	0.78
MIRS/FE-LMK	**-0.04**	0.58	**0.08**	0.78		

CCEM.M-K1 and EUROMET.EM.M-K1

Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2), for frequency 5 kHz



Red diamonds : participants in CCEM.M-K1
Green triangles : participants in EUROMET.EM.M-K1 only

Key comparison CCEM.M-K1

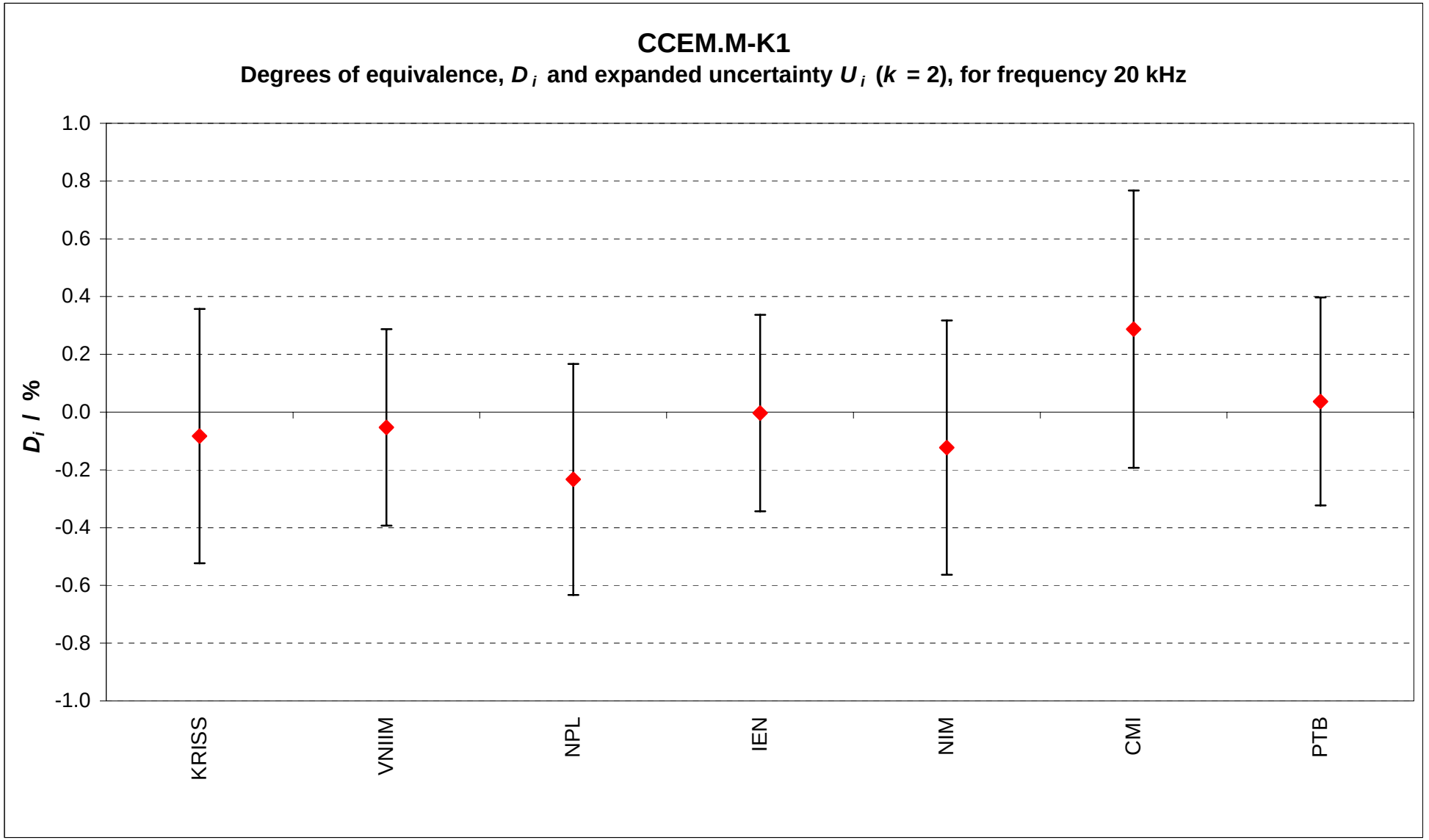
MEASURAND : Coil constant at a frequency of 20 kHz

Matrix of Equivalence

Lab *j* ⇨

Lab *i* ⇩

	D_i / 10^{-2}	U_i / 10^{-2}	KRISS		VNIIM		NPL		IEN		NIM		CMI		PTB	
			D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}	D_{ij} / 10^{-2}	U_{ij} / 10^{-2}
KRISS	**-0.083**	0.44			**-0.03**	0.56	**0.15**	0.59	**-0.08**	0.56	**0.04**	0.62	**-0.37**	0.65	**-0.12**	0.57
VNIIM	**-0.053**	0.34	**0.03**	0.56			**0.18**	0.53	**-0.05**	0.48	**0.07**	0.56	**-0.34**	0.59	**-0.09**	0.50
NPL	**-0.233**	0.40	**-0.15**	0.59	**-0.18**	0.53			**-0.23**	0.53	**-0.11**	0.59	**-0.52**	0.62	**-0.27**	0.54
IEN	**-0.003**	0.34	**0.08**	0.56	**0.05**	0.48	**0.23**	0.53			**0.12**	0.56	**-0.29**	0.59	**-0.04**	0.50
NIM	**-0.123**	0.44	**-0.04**	0.62	**-0.07**	0.56	**0.11**	0.59	**-0.12**	0.56			**-0.41**	0.65	**-0.16**	0.57
CMI	**0.287**	0.48	**0.37**	0.65	**0.34**	0.59	**0.52**	0.62	**0.29**	0.59	**0.41**	0.65			**0.25**	0.60
PTB	**0.037**	0.36	**0.12**	0.57	**0.09**	0.50	**0.27**	0.54	**0.04**	0.50	**0.16**	0.57	**-0.25**	0.60		


CCEM.M-K1
Degrees of equivalence, D_i and expanded uncertainty U_i (k = 2), for frequency 20 kHz
D_i / %
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
KRISS
VNIIM
NPL
IEN
NIM
CMI
PTB