Key comparison CCEM-K2 **MEASURAND : Resistance** **NOMINAL VALUE : 1 GΩ**

x_i: result of measurement carried out by laboratory i, expressed as the relative deviation from the nominal value R_0 = 1 GΩ, namely $R_i = R_0(1 + x_i)$ where R_i is the resistance measured by laboratory i; the x_i's are corrected to a nominal temperature of 23 °C

U_i: expanded uncertainty (k = 2) of x_i

S/N serial number of the travelling standard

$D_{i\,COMB}$ combined mean of the three travelling standards relative differences from a least-squares linear regression of the NIST values for each travelling standard

$U_{i\,COMB}$ expanded uncertainty (k = 2) of $D_{i\,COMB}$

(the calculation of the $D_{i\,COMB}$'s and $U_{i\,COMB}$'s is described in detail in the report)

Lab i ⇩	S/N			U_i	Mean date of measurement	$D_{i\,COMB}$	$U_{i\,COMB}$
	HR9101	HR9102	HR9106				
	x_i	x_i	x_i				
	/ 10^{-6}	/ 10^{-6}	/ 10^{-6}	/ 10^{-6}		/ 10^{-6}	/ 10^{-6}
NIST	8.7	-109.4	734.4	10.0	1996-08-24	-6.7	9.3
NRC	15	-102	743	20.0	1996-10-11	-0.1	20.0
NIST	20.3	-102.0	744.8	10.0	1996-12-08	0.9	9.3
LNE	17	-101	745	18	1997-02-18	-1.2	18.3
NPL	10	-97	737	10.0	1997-05-08	-7.1	11.4
PTB	27	-89	748	15.0	1997-07-12	3.4	13.4
NIST	27.6	-88.8	752.3	10.0	1997-08-12	4.8	9.3
NMIA	25	-89	752	70.0	1997-10-25	2.2	66.9
MSL	30	-84	755	5.3	1998-01-11	4.7	7.3
NMISA	-40	-130	700	600	1998-02-15	-52.7	581
NIST	31.9	-81.0	758.2	10.0	1998-04-29	5.1	9.3
SP	25.5	-86.9	754.0	8.8	1998-06-27	-1.5	10.5
METAS	32.4	-81.0	758.2	23.0	1998-08-15	3.0	23.0
INRIM	31.2	-79.9	760.4	19.5	1998-10-17	2.6	19.5
VSL	1	-111	724	40.0	1999-01-03	-32.2	36.4
NIST	31.0	-77.4	759.9	10.0	1999-02-22	0.2	9.3
KRISS	32	-76	759	11.8	1999-05-23	-1.4	12.8
NIST	31.4	-77.5	762.4	10.0	1999-08-07	-2.2	9.3
NIM*	35.0	-74.5	766.9	6.6	1999-11-14	-0.5	8.9
VNIIM**	38	-72	768	4.5	2000-01-23	0.1	8.0
NIST	38.1	-72.3	765.6	10.0	2000-03-13	-2.1	9.3
NIST(Mean)					1998-05-07	0.0	9.3

*** Measurements at 91 V**
**** Measurements at 50 V**
All other measurements at 100 V

Key comparison SIM.EM-K2

MEASURAND : **Resistance**
NOMINAL VALUE : **1 GΩ**

Individual measurements reported by laboratories participant in SIM.EM-K2 are given in Tables 6.5 and 6.6 for both of the transfer instruments: see on pages 17 and 18 of the SIM.EM-K2 Final Report. These are relative difference between the result of measurement of laboratory *i* and the nominal value 1 GΩ.

Measurements were carried out between January 2006 and August 2007.

Key comparison EUROMET.EM-K2

MEASURAND : **Resistance**
NOMINAL VALUE : **1 GΩ**

Individual measurements and uncertainties reported by laboratories participant in EUROMET.EM-K2 are given in the annexes of the EUROMET.EM-K2 Final Report.
LATMB (Latvia) did not measure at nominal value 1 GΩ.

Measurements were carried out between August 2005 and April 2007.

Key comparison EURAMET.EM-K2.1

MEASURAND : **Resistance**
NOMINAL VALUE : **1 GΩ**

Individual measurements and uncertainties reported by laboratories participant in EURAMET.EM-K2.1 are given in the annexes of the EURAMET.EM-K2.1 Final Report.

Measurements were carried out between March 2010 and February 2011.

Key comparisons CCEM-K2, SIM.EM-K2, EUROMET.EM-K2 and EURAMET.EM-K2.1

MEASURAND : Resistance **NOMINAL VALUE : 1 GΩ**

Key comparison CCEM-K2

The key comparison reference value is obtained from the weighted average of the $D_{i\,COMB}$'s, and is $x_R = 0.10 \times 10^{-6}$.
The expanded uncertainty ($k = 2$) of x_R is: $U_R = 3.19 \times 10^{-6}$.

The degree of equivalence of each laboratory with respect to the key comparison reference value is given by a pair of terms: $D_i = D_{i\,COMB} - x_R$ and its expanded uncertainty ($k = 2$), $U_i = (U_{i\,COMB}^2 - U_R^2)^{1/2}$.

The degree of equivalence between two laboratories is given by a pair of terms: $D_{ij} = D_i - D_j$ and its expanded uncertainty ($k = 2$), U_{ij} which calculation is described in detail in the CCEM-K2 Final Report.

Key comparison SIM.EM-K2

The procedure for analysing the results of SIM.EM-K2 is explained in the Appendix A of the SIM.EM-K2 Final Report. A SIM.EM-K2 reference value and its uncertainty are first computed using results obtained in this key comparison. Degrees of equivalence of each participating laboratory with respect to the SIM.EM-K2 reference value, as well as pair-wise degrees of equivalence, are then computed.

Linking SIM.EM-K2 to CCEM-K2

The linkage of SIM.EM-K2 results to those of CCEM-K2 is ensured by the common participation of NIST and NRC in both comparisons. The detailed calculation of the linkage is explained in Appendix G of the Final Report.

Key comparison EUROMET.EM-K2

The procedure for analysing the results of EUROMET.EM-K2 is explained in Section 6.4 on page 17 of the EUROMET.EM-K2 Final Report. A EUROMET.EM-K2 reference value and its uncertainty are first computed using results obtained in this key comparison. Degrees of equivalence of each participating laboratory with respect to the EUROMET.EM-K2 reference value, as well as pair-wise degrees of equivalence, are then computed.

Linking EUROMET.EM-K2 to CCEM-K2

The linkage of EUROMET.EM-K2 results to those of CCEM-K2 is ensured by the common participation of METAS, PTB, VSL, NPL, LNE and VNIIM in both comparisons. The detailed calculation of the linkage is explained in Section 6.6 on page 31 of the Final Report.

Linking EURAMET.EM-K2.1 to CCEM-K2

The results of EURAMET.EM-K2.1 are first linked to the EUROMET.EM-K2 reference value through the results of METAS, and then linked to the CCEM-K2 key comparison reference value as done for the EUROMET.EM-K2 results (see Sections 6.3 and 6.4 of the EURAMET.EM-K2.1 Final Report).

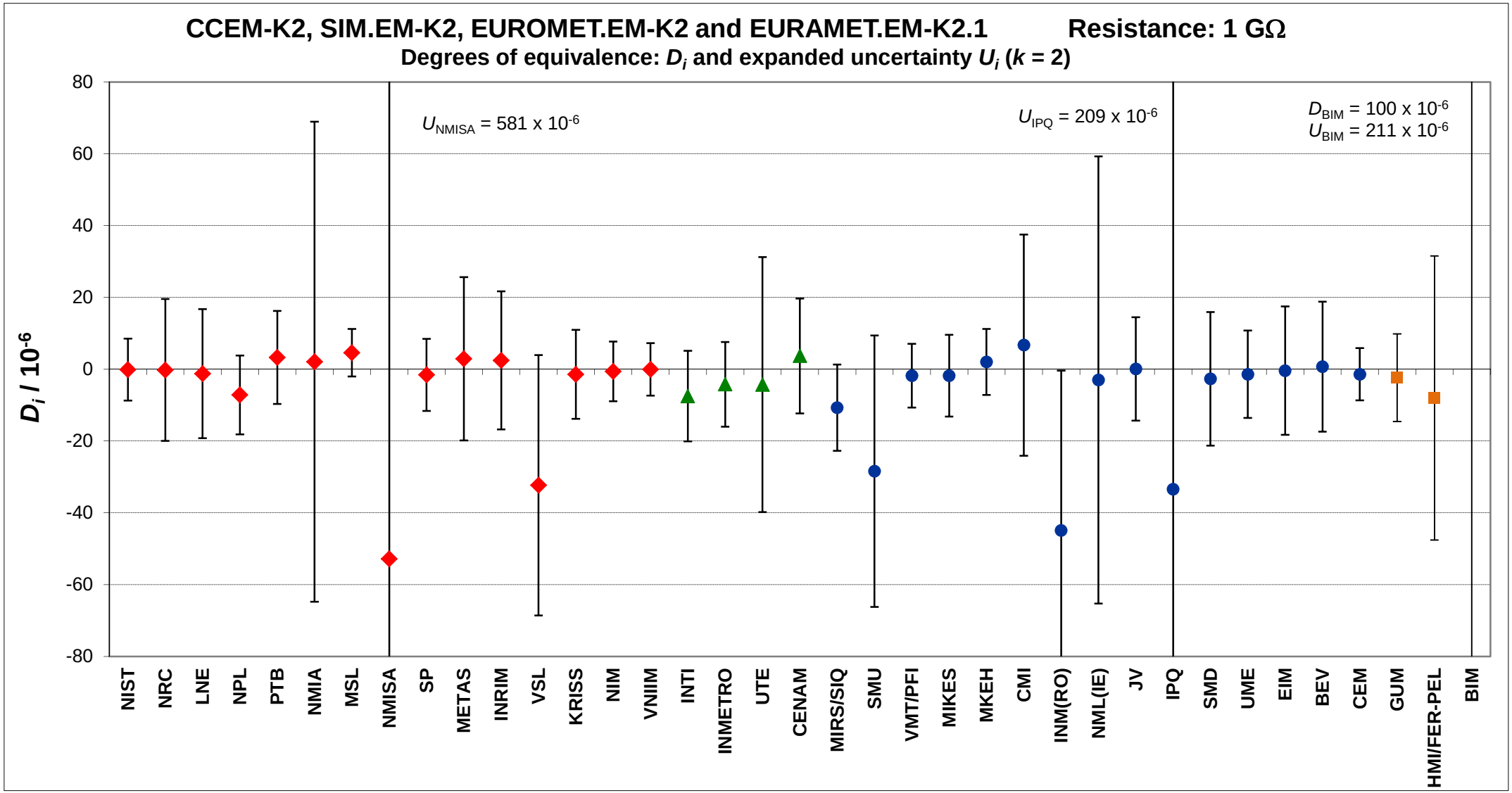
This makes it possible to extend the CCEM-K2 degrees of equivalence to those laboratories which participated in key comparisons SIM.EM-K2, EUROMET.EM-K2 and EURAMET.EM-K2.1 only. No pair-wise degrees of equivalence involving EURAMET.EM-K2.1 have been computed.

Degrees of equivalence relative to the CCEM key comparison reference value

Lab *i* ⇩

	D_i / 10^{-6}	U_i / 10^{-6}
NIST	-0.1	8.6
NRC	-0.2	19.8
LNE	-1.3	18.0
NPL	-7.2	11.0
PTB	3.3	13.0
NMIA	2.1	66.8
MSL	4.6	6.6
NMISA	-53	581
SP	-1.6	10.0
METAS	2.9	22.8
INRIM	2.5	19.3
VSL	-32.3	36.3
KRISS	-1.5	12.4
NIM	-0.6	8.3
VNIIM	0.0	7.3
INTI	-7.5	12.6
INMETRO	-4.2	11.8
UTE	-4.3	35.5
CENAM	3.7	16.0
MIRS/SIQ	-10.7	12.0
SMU	-28.4	37.8
VMT/PFI	-1.8	8.9
MIKES	-1.8	11.4
MKEH	2.0	9.2
CMI	6.7	30.8
INM(RO)	-44.9	44.5
NML(IE)	-3.0	62.3
JV	0.1	14.4
IPQ	-33	209
SMD	-2.7	18.6
UME	-1.4	12.2
EIM	-0.4	17.9
BEV	0.7	18.1
CEM	-1.4	7.3
GUM	-2.4	12.2
HMI/FER-PEL	-8.0	39.6
BIM	100.6	211.5

In black: participants in CCEM-K2
In green: participants in SIM.EM-K2 only
In blue: participants in EUROMET.EM-K2 only
In orange: participants in EURAMET.EM-K2.1 only



Red diamonds: participants in CCEM-K2
Green triangles: participants in SIM.EM-K2 only
Blue circles: participants in EUROMET.EM-K2
Orange squares: participants in EURAMET.EM-K2.1

Key comparisons CCEM-K2, SIM.EM-K2 and EUROMET.EM-K2

Resistance 1 GΩ **Matrix of equivalence**

values computed inside SIM.EM-K2: see item (2) on page 55 of the SIM.EM-K2 Final Report

Lab *i* ⇩ / Lab *j* ⇨	D_i / 10^{-6}	U_i / 10^{-6}	NIST D_{ij} / 10^{-6}	NIST U_{ij} / 10^{-6}	NRC D_{ij} / 10^{-6}	NRC U_{ij} / 10^{-6}	LNE D_{ij} / 10^{-6}	LNE U_{ij} / 10^{-6}	NPL D_{ij} / 10^{-6}	NPL U_{ij} / 10^{-6}	PTB D_{ij} / 10^{-6}	PTB U_{ij} / 10^{-6}	NMIA D_{ij} / 10^{-6}	NMIA U_{ij} / 10^{-6}	MSL D_{ij} / 10^{-6}	MSL U_{ij} / 10^{-6}	NMISA D_{ij} / 10^{-6}	NMISA U_{ij} / 10^{-6}	SP D_{ij} / 10^{-6}	SP U_{ij} / 10^{-6}
NIST	**-0.1**	8.6			**0.1**	22.1	**1.2**	20.5	**7.1**	14.7	**-3.4**	16.3	**-2.2**	67.5	**-4.7**	11.8	**53**	581	**1.5**	14.0
NRC	**-0.2**	19.8	**-0.1**	22.1			**1.0**	26.7	**6.9**	22.7	**-3.5**	23.7	**-2.3**	69.7	**-4.8**	20.9	**53**	581	**1.3**	22.1
LNE	**-1.3**	18.0	**-1.2**	20.5	**-1.0**	26.7			**5.9**	21.2	**-4.5**	22.3	**-3.4**	69.3	**-5.9**	19.3	**52**	581	**0.3**	20.7
NPL	**-7.2**	11.0	**-7.1**	14.7	**-6.9**	22.7	**-5.9**	21.2			**-10.4**	17.2	**-9.2**	67.8	**-11.8**	13.1	**46**	581	**-5.6**	15.1
PTB	**3.3**	13.0	**3.4**	16.3	**3.5**	23.7	**4.5**	22.3	**10.4**	17.2			**1.2**	68.1	**-1.3**	14.9	**56**	581	**4.8**	16.6
NMIA	**2.1**	66.8	**2.2**	67.5	**2.3**	69.7	**3.4**	69.3	**9.2**	67.8	**-1.2**	68.1			**-2.5**	67.2	**55**	585	**3.7**	67.7
MSL	**4.6**	6.6	**4.7**	11.8	**4.8**	20.9	**5.9**	19.3	**11.8**	13.1	**1.3**	14.9	**2.5**	67.2			**57**	581	**6.2**	12.5
NMISA	**-53**	581	**-53**	581	**-53**	581	**-52**	581	**-46**	581	**-56**	581	**-55**	585	**-57**	581			**-51**	581
SP	**-1.6**	10.0	**-1.5**	14.0	**-1.3**	22.1	**-0.3**	20.7	**5.6**	15.1	**-4.8**	16.6	**-3.7**	67.7	**-6.2**	12.5	**51**	581		
METAS	**2.9**	22.8	**3.0**	24.8	**3.1**	30.1	**4.2**	29.0	**10.0**	25.4	**-0.4**	26.3	**0.8**	70.7	**-1.7**	23.9	**56**	581	**4.5**	25.1
INRIM	**2.5**	19.3	**2.6**	21.6	**2.7**	27.5	**3.7**	26.3	**9.6**	22.2	**-0.8**	23.3	**0.4**	69.6	**-2.2**	20.6	**55**	581	**4.0**	22.0
VSL	**-32.3**	36.3	**-32.2**	37.6	**-32.1**	41.2	**-31.1**	40.5	**-25.2**	37.9	**-35.6**	38.6	**-34.4**	76.1	**-36.9**	37.0	**20**	582	**-30.8**	37.8
KRISS	**-1.5**	12.4	**-1.4**	15.8	**-1.2**	23.0	**-0.2**	21.6	**5.7**	16.4	**-4.7**	17.9	**-3.5**	68.0	**-6.1**	14.2	**51**	581	**0.1**	16.2
NIM	**-0.6**	8.3	**-0.5**	12.9	**-0.4**	20.8	**0.6**	19.3	**6.5**	13.3	**-3.9**	15.1	**-2.7**	67.3	**-5.2**	10.5	**52**	581	**1.0**	13.1
VNIIM	**0.0**	7.3	**0.1**	12.2	**0.2**	20.3	**1.2**	18.8	**7.1**	12.5	**-3.3**	14.4	**-2.1**	67.2	**-4.7**	9.5	**53**	581	**1.5**	12.3
INTI	**-7.5**	12.6	**-8.2**	10.0	**-1.4**	16.0	**-6.2**	21.9	**-0.3**	16.7	**-10.8**	18.1	**-9.6**	68.0	**-12.1**	14.2	**45**	581	**-5.9**	16.1
INMETRO	**-4.2**	11.8	**-4.9**	9.0	**2.0**	15.4	**-2.9**	21.5	**3.0**	16.1	**-7.5**	17.5	**-6.3**	67.8	**-8.8**	13.5	**49**	581	**-2.6**	15.4
UTE	**-4.3**	35.5	**-5.0**	34.7	**1.9**	36.9	**-3.0**	39.8	**2.9**	37.2	**-7.6**	37.8	**-6.4**	75.6	**-8.9**	36.1	**49**	582	**-2.7**	36.9
CENAM	**3.7**	16.0	**3.0**	14.0	**9.9**	18.7	**5.0**	24.1	**10.9**	19.4	**0.4**	20.6	**1.6**	68.7	**-0.9**	17.3	**57**	581	**5.3**	18.8
MIRS/SIQ	**-10.7**	12.0	**-10.6**	14.7	**-10.5**	23.1	**-9.4**	20.3	**-3.5**	14.2	**-14.0**	16.1	**-12.8**	67.9	**-15.3**	13.7	**42**	581	**-9.1**	15.6
SMU	**-28.4**	37.8	**-28.3**	38.8	**-28.2**	42.7	**-27.1**	41.2	**-21.2**	38.6	**-31.7**	39.3	**-30.5**	76.8	**-33.0**	38.4	**25**	582	**-26.8**	39.1
VMT/PFI	**-1.8**	8.9	**-1.7**	12.4	**-1.6**	21.7	**-0.5**	18.7	**5.4**	11.8	**-5.1**	14.0	**-3.9**	67.4	**-6.4**	11.1	**51**	581	**-0.2**	13.4
MIKES	**-1.8**	11.4	**-1.7**	14.3	**-1.6**	22.9	**-0.5**	20.0	**5.4**	13.8	**-5.1**	15.7	**-3.9**	67.8	**-6.4**	13.2	**51**	581	**-0.2**	15.2
MKEH	**2.0**	9.2	**2.1**	12.6	**2.2**	21.8	**3.3**	18.8	**9.2**	12.0	**-1.3**	14.2	**-0.1**	67.4	**-2.6**	11.3	**55**	581	**3.6**	13.6
CMI	**6.7**	30.8	**6.8**	32.0	**6.8**	36.6	**8.0**	34.9	**13.9**	31.7	**3.4**	32.6	**4.5**	73.6	**2.0**	31.5	**60**	582	**8.3**	32.4
INM(RO)	**-44.9**	44.5	**-44.8**	45.3	**-44.7**	48.7	**-43.6**	47.4	**-37.7**	45.2	**-48.2**	45.8	**-47.0**	80.3	**-49.5**	45.0	**8**	583	**-43.3**	45.6
NML(IE)	**-3.0**	62.3	**-2.9**	62.8	**-2.8**	65.3	**-1.7**	64.4	**4.2**	62.7	**-6.3**	63.2	**-5.1**	91.3	**-7.6**	62.6	**50**	584	**-1.4**	63.1
JV	**0.1**	14.4	**0.2**	16.7	**0.3**	24.5	**1.4**	21.8	**7.3**	16.3	**-3.2**	18.0	**-2.0**	68.3	**-4.5**	15.8	**53**	581	**1.7**	17.5
IPQ	**-33**	209	**-33**	209	**-33**	210	**-32**	209	**-26**	209	**-37**	209	**-36**	219	**-38**	209	**20**	617	**-32**	209
SMD	**-2.7**	18.6	**-2.6**	20.5	**-2.5**	27.2	**-1.4**	24.8	**4.5**	20.2	**-6.0**	21.5	**-4.8**	69.4	**-7.3**	19.8	**50**	581	**-1.1**	21.2
UME	**-1.4**	12.2	**-1.3**	14.9	**-1.2**	23.3	**-0.1**	20.5	**5.8**	14.4	**-4.7**	16.3	**-3.5**	67.9	**-6.0**	13.9	**52**	581	**0.2**	15.8
EIM	**-0.4**	17.9	**-0.3**	19.9	**-0.2**	26.7	**0.9**	24.3	**6.8**	19.5	**-3.7**	20.9	**-2.5**	69.2	**-5.0**	19.1	**53**	581	**1.2**	20.5
BEV	**0.7**	18.1	**0.8**	20.0	**0.9**	26.8	**2.0**	24.4	**7.9**	19.6	**-2.6**	21.0	**-1.4**	69.2	**-3.9**	19.2	**54**	581	**2.3**	20.6
CEM	**-1.4**	7.3	**-1.3**	11.3	**-1.2**	21.1	**-0.1**	18.0	**5.8**	10.6	**-4.7**	13.0	**-3.5**	67.2	**-6.0**	9.8	**52**	581	**0.2**	12.4

Key comparisons CCEM-K2, SIM.EM-K2 and EUROMET.EM-K2

Resistance 1 GΩ — **Matrix of equivalence (Continued)**

values computed inside SIM.EM-K2: see item (2) on page 55 of the SIM.EM-K2 Final Report

Lab *i* ⇩ / Lab *j* ⇨

Lab *i*	D_i / 10^{-6}	U_i / 10^{-6}	METAS D_{ij} / 10^{-6}	METAS U_{ij} / 10^{-6}	INRIM D_{ij} / 10^{-6}	INRIM U_{ij} / 10^{-6}	VSL D_{ij} / 10^{-6}	VSL U_{ij} / 10^{-6}	KRISS D_{ij} / 10^{-6}	KRISS U_{ij} / 10^{-6}	NIM D_{ij} / 10^{-6}	NIM U_{ij} / 10^{-6}	VNIIM D_{ij} / 10^{-6}	VNIIM U_{ij} / 10^{-6}	INTI D_{ij} / 10^{-6}	INTI U_{ij} / 10^{-6}	INMETRO D_{ij} / 10^{-6}	INMETRO U_{ij} / 10^{-6}	UTE D_{ij} / 10^{-6}	UTE U_{ij} / 10^{-6}
NIST	-0.1	8.6	-3.0	24.8	-2.6	21.6	32.2	37.6	1.4	15.8	0.5	12.9	-0.1	12.2	8.2	10.0	4.9	9.0	5.0	34.7
NRC	-0.2	19.8	-3.1	30.1	-2.7	27.5	32.1	41.2	1.2	23.0	0.4	20.8	-0.2	20.3	1.4	16.0	-2.0	15.4	-1.9	36.9
LNE	-1.3	18.0	-4.2	29.0	-3.7	26.3	31.1	40.5	0.2	21.6	-0.6	19.3	-1.2	18.8	6.2	21.9	2.9	21.5	3.0	39.8
NPL	-7.2	11.0	-10.0	25.4	-9.6	22.2	25.2	37.9	-5.7	16.4	-6.5	13.3	-7.1	12.5	0.3	16.7	-3.0	16.1	-2.9	37.2
PTB	3.3	13.0	0.4	26.3	0.8	23.3	35.6	38.6	4.7	17.9	3.9	15.1	3.3	14.4	10.8	18.1	7.5	17.5	7.6	37.8
NMIA	2.1	66.8	-0.8	70.7	-0.4	69.6	34.4	76.1	3.5	68.0	2.7	67.3	2.1	67.2	9.6	68.0	6.3	67.8	6.4	75.6
MSL	4.6	6.6	1.7	23.9	2.2	20.6	36.9	37.0	6.1	14.2	5.2	10.5	4.7	9.5	12.1	14.2	8.8	13.5	8.9	36.1
NMISA	-53	581	-56	581	-55	581	-20	582	-51	581	-52	581	-53	581	-45	581	-49	581	-49	582
SP	-1.6	10.0	-4.5	25.1	-4.0	22.0	30.8	37.8	-0.1	16.2	-1.0	13.1	-1.5	12.3	5.9	16.1	2.6	15.4	2.7	36.9
METAS	2.9	22.8			0.4	30.0	35.2	42.9	4.3	26.1	3.5	24.3	2.9	23.9	10.4	26.0	7.1	25.7	7.2	42.2
INRIM	2.5	19.3	-0.4	30.0			34.8	41.2	3.9	23.1	3.1	21.0	2.5	20.6	10.0	23.0	6.7	22.6	6.8	40.4
VSL	-32.3	36.3	-35.2	42.9	-34.8	41.2			-30.9	38.4	-31.7	37.2	-32.3	37.0	-24.8	38.4	-28.1	38.2	-28.0	50.8
KRISS	-1.5	12.4	-4.3	26.1	-3.9	23.1	30.9	38.4			-0.8	15.0	-1.4	14.4	6.0	17.7	2.7	17.1	2.8	37.6
NIM	-0.6	8.3	-3.5	24.3	-3.1	21.0	31.7	37.2	0.8	15.0			-0.6	11.0	6.9	15.1	3.6	14.4	3.7	36.5
VNIIM	0.0	7.3	-2.9	23.9	-2.5	20.6	32.3	37.0	1.4	14.4	0.6	11.0			7.5	14.5	4.2	13.8	4.3	36.2
INTI	-7.5	12.6	-10.4	26.0	-10.0	23.0	24.8	38.4	-6.0	17.7	-6.9	15.1	-7.5	14.5			-3.4	13.1	-3.2	35.9
INMETRO	-4.2	11.8	-7.1	25.7	-6.7	22.6	28.1	38.2	-2.7	17.1	-3.6	14.4	-4.2	13.8	3.4	13.1			0.1	35.7
UTE	-4.3	35.5	-7.2	42.2	-6.8	40.4	28.0	50.8	-2.8	37.6	-3.7	36.5	-4.3	36.2	3.2	35.9	-0.1	35.7		
CENAM	3.7	16.0	0.8	27.8	1.2	25.0	36.0	39.7	5.2	20.2	4.3	18.0	3.7	17.5	11.2	17.0	7.8	16.4	8.0	37.4
MIRS/SIQ	-10.7	12.0	-13.6	24.4	-13.2	22.7	21.6	37.3	-9.2	17.2	-10.1	14.6	-10.7	12.3	-3.2	17.4	-6.5	16.8	-6.4	37.5
SMU	-28.4	37.8	-31.3	43.4	-30.9	42.4	3.9	51.7	-26.9	39.8	-27.8	38.7	-28.4	37.9	-20.9	39.8	-24.2	39.6	-24.1	51.9
VMT/PFI	-1.8	8.9	-4.7	23.1	-4.3	21.3	30.5	36.4	-0.3	15.3	-1.2	12.2	-1.8	9.4	5.7	15.4	2.4	14.8	2.5	36.6
MIKES	-1.8	11.4	-4.7	24.2	-4.3	22.4	30.5	37.1	-0.3	16.9	-1.2	14.1	-1.8	11.8	5.7	17.0	2.4	16.4	2.5	37.3
MKEH	2.0	9.2	-0.9	23.2	-0.5	21.4	34.3	36.5	3.5	15.4	2.6	12.4	2.0	9.7	9.5	15.6	6.2	14.9	6.3	36.7
CMI	6.7	30.8	3.8	37.4	4.2	36.3	39.0	46.9	8.2	33.2	7.3	31.9	6.7	30.9	14.2	33.3	10.9	33.0	10.9	47.0
INM(RO)	-44.9	44.5	-47.8	49.3	-47.4	48.5	-12.6	56.8	-43.4	46.2	-44.3	45.3	-44.9	44.6	-37.4	46.3	-40.7	46.0	-40.6	56.9
NML(IE)	-3.0	62.3	-5.9	65.8	-5.5	65.2	29.3	71.6	-1.5	63.5	-2.4	62.8	-3.0	62.3	4.5	63.5	1.2	63.4	1.3	71.7
JV	0.1	14.4	-2.8	25.7	-2.4	24.1	32.4	38.1	1.6	19.0	0.7	16.6	0.1	14.7	7.6	19.1	4.3	18.6	4.4	38.3
IPQ	-33	209	-36	210	-36	209	-1	212	-32	209	-33	209	-33	209	-26	209	-29	209	-29	212
SMD	-2.7	18.6	-5.6	28.3	-5.2	26.8	29.6	39.9	-1.2	22.4	-2.1	20.4	-2.7	18.9	4.8	22.5	1.5	22.1	1.6	40.1
UME	-1.4	12.2	-4.3	24.6	-3.9	22.8	30.9	37.4	0.1	17.4	-0.8	14.8	-1.4	12.6	6.1	17.6	2.8	17.0	2.9	37.5
EIM	-0.4	17.9	-3.3	27.8	-2.9	26.3	31.9	39.6	1.1	21.8	0.2	19.8	-0.4	18.2	7.1	21.9	3.8	21.5	3.9	39.8
BEV	0.7	18.1	-2.2	27.9	-1.8	26.4	33.0	39.7	2.2	21.9	1.3	19.9	0.7	18.3	8.2	22.0	4.9	21.6	5.0	39.8
CEM	-1.4	7.3	-4.3	22.5	-3.9	20.6	30.9	36.1	0.1	14.4	-0.8	11.1	-1.4	7.9	6.1	14.6	2.8	13.9	2.9	36.2

Key comparisons CCEM-K2, SIM.EM-K2 and EUROMET.EM-K2

Resistance 1 GΩ — **Matrix of equivalence (Continued)**

values computed inside SIM.EM-K2: see item (2) on page 55 of the SIM.EM-K2 Final Report

Lab *i* ⇩ / Lab *j* ⇨

Lab *i*	D_i / 10^{-6}	U_i / 10^{-6}	CENAM D_{ij} / 10^{-6}	CENAM U_{ij} / 10^{-6}	MIRS/SIQ D_{ij} / 10^{-6}	MIRS/SIQ U_{ij} / 10^{-6}	SMU D_{ij} / 10^{-6}	SMU U_{ij} / 10^{-6}	VMT/PFI D_{ij} / 10^{-6}	VMT/PFI U_{ij} / 10^{-6}	MIKES D_{ij} / 10^{-6}	MIKES U_{ij} / 10^{-6}	MKEH D_{ij} / 10^{-6}	MKEH U_{ij} / 10^{-6}	CMI D_{ij} / 10^{-6}	CMI U_{ij} / 10^{-6}	INM(RO) D_{ij} / 10^{-6}	INM(RO) U_{ij} / 10^{-6}
NIST	-0.1	8.6	-3.0	14.0	10.6	14.7	28.3	38.8	1.7	12.4	1.7	14.3	-2.1	12.6	-6.8	32.0	44.8	45.3
NRC	-0.2	19.8	-9.9	18.7	10.5	23.1	28.2	42.7	1.6	21.7	1.6	22.9	-2.2	21.8	-6.8	36.6	44.7	48.7
LNE	-1.3	18.0	-5.0	24.1	9.4	20.3	27.1	41.2	0.5	18.7	0.5	20.0	-3.3	18.8	-8.0	34.9	43.6	47.4
NPL	-7.2	11.0	-10.9	19.4	3.5	14.2	21.2	38.6	-5.4	11.8	-5.4	13.8	-9.2	12.0	-13.9	31.7	37.7	45.2
PTB	3.3	13.0	-0.4	20.6	14.0	16.1	31.7	39.3	5.1	14.0	5.1	15.7	1.3	14.2	-3.4	32.6	48.2	45.8
NMIA	2.1	66.8	-1.6	68.7	12.8	67.9	30.5	76.8	3.9	67.4	3.9	67.8	0.1	67.4	-4.5	73.6	47.0	80.3
MSL	4.6	6.6	0.9	17.3	15.3	13.7	33.0	38.4	6.4	11.1	6.4	13.2	2.6	11.3	-2.0	31.5	49.5	45.0
NMISA	-53	581	-57	581	-42	581	-25	582	-51	581	-51	581	-55	581	-60	582	-8	583
SP	-1.6	10.0	-5.3	18.8	9.1	15.6	26.8	39.1	0.2	13.4	0.2	15.2	-3.6	13.6	-8.3	32.4	43.3	45.6
METAS	2.9	22.8	-0.8	27.8	13.6	24.4	31.3	43.4	4.7	23.1	4.7	24.2	0.9	23.2	-3.8	37.4	47.8	49.3
INRIM	2.5	19.3	-1.2	25.0	13.2	22.7	30.9	42.4	4.3	21.3	4.3	22.4	0.5	21.4	-4.2	36.3	47.4	48.5
VSL	-32.3	36.3	-36.0	39.7	-21.6	37.3	-3.9	51.7	-30.5	36.4	-30.5	37.1	-34.3	36.5	-39.0	46.9	12.6	56.8
KRISS	-1.5	12.4	-5.2	20.2	9.2	17.2	26.9	39.8	0.3	15.3	0.3	16.9	-3.5	15.4	-8.2	33.2	43.4	46.2
NIM	-0.6	8.3	-4.3	18.0	10.1	14.6	27.8	38.7	1.2	12.2	1.2	14.1	-2.6	12.4	-7.3	31.9	44.3	45.3
VNIIM	0.0	7.3	-3.7	17.5	10.7	12.3	28.4	37.9	1.8	9.4	1.8	11.8	-2.0	9.7	-6.7	30.9	44.9	44.6
INTI	-7.5	12.6	-11.2	17.0	3.2	17.4	20.9	39.8	-5.7	15.4	-5.7	17.0	-9.5	15.6	-14.2	33.3	37.4	46.3
INMETRO	-4.2	11.8	-7.8	16.4	6.5	16.8	24.2	39.6	-2.4	14.8	-2.4	16.4	-6.2	14.9	-10.9	33.0	40.7	46.0
UTE	-4.3	35.5	-8.0	37.4	6.4	37.5	24.1	51.9	-2.5	36.6	-2.5	37.3	-6.3	36.7	-10.9	47.0	40.6	56.9
CENAM	3.7	16.0			14.4	20.0	32.1	41.0	5.5	18.3	5.5	19.7	1.7	18.4	-3.0	34.7	48.6	47.3
MIRS/SIQ	-10.7	12.0	-14.4	20.0			17.7	38.8	-8.9	12.6	-8.9	14.4	-12.8	12.7	-17.4	32.0	34.2	45.3
SMU	-28.4	37.8	-32.1	41.0	-17.7	38.8			-26.6	38.0	-26.6	38.6	-30.4	38.0	-35.1	48.0	16.5	57.8
VMT/PFI	-1.8	8.9	-5.5	18.3	8.9	12.6	26.6	38.0			0.0	12.0	-3.9	9.8	-8.5	30.9	43.1	44.6
MIKES	-1.8	11.4	-5.5	19.7	8.9	14.4	26.6	38.6	0.0	12.0			-3.9	12.0	-8.5	31.7	43.1	45.1
MKEH	2.0	9.2	-1.7	18.4	12.8	12.7	30.4	38.0	3.9	9.8	3.9	12.0			-4.6	30.9	47.0	44.6
CMI	6.7	30.8	3.0	34.7	17.4	32.0	35.1	48.0	8.5	30.9	8.5	31.7	4.6	30.9			51.6	53.4
INM(RO)	-44.9	44.5	-48.6	47.3	-34.2	45.3	-16.5	57.8	-43.1	44.6	-43.1	45.1	-47.0	44.6	-51.6	53.4		
NML(IE)	-3.0	62.3	-6.7	64.3	7.8	62.9	25.4	72.4	-1.1	62.4	-1.1	62.8	-5.0	62.4	-9.6	69.0	41.9	76.1
JV	0.1	14.4	-3.6	21.5	10.8	17.0	28.5	39.7	1.9	15.0	1.9	16.5	-2.0	15.1	-6.6	33.0	45.0	46.0
IPQ	-33	209	-37	209	-23	209	-5	212	-32	209	-32	209	-36	209	-40	211	12	213
SMD	-2.7	18.6	-6.4	24.6	8.0	20.8	25.7	41.4	-0.9	19.2	-0.9	20.4	-4.7	19.2	-9.3	35.1	42.2	47.6
UME	-1.4	12.2	-5.1	20.1	9.3	15.1	27.0	38.9	0.4	12.8	0.4	14.5	-3.5	12.8	-8.1	32.0	43.5	45.4
EIM	-0.4	17.9	-4.1	24.0	10.3	20.1	28.0	41.1	1.4	18.4	1.4	19.7	-2.5	18.4	-7.1	34.6	44.5	47.3
BEV	0.7	18.1	-3.0	24.1	11.4	20.2	29.1	41.1	2.5	18.5	2.5	19.8	-1.4	18.6	-6.0	34.7	45.6	47.3
CEM	-1.4	7.3	-5.1	17.6	9.3	11.7	27.0	37.7	0.4	8.5	0.4	11.0	-3.5	8.6	-8.1	30.6	43.5	44.4

Key comparisons CCEM-K2, SIM.EM-K2 and EUROMET.EM-K2

Resistance 1 GΩ — **Matrix of equivalence (Continued)**

Lab *j* ⇒ ; Lab *i* ⇓

Lab *i*			NML(IE)		JV		IPQ		SMD		UME		EIM		BEV		CEM	
	D_i / 10^{-6}	U_i / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}	D_{ij} / 10^{-6}	U_{ij} / 10^{-6}
NIST	**-0.1**	8.6	**2.9**	62.8	**-0.2**	16.7	**33**	209	**2.6**	20.5	**1.3**	14.9	**0.3**	19.9	**-0.8**	20.0	**1.3**	11.3
NRC	**-0.2**	19.8	**2.8**	65.3	**-0.3**	24.5	**33**	210	**2.5**	27.2	**1.2**	23.3	**0.2**	26.7	**-0.9**	26.8	**1.2**	21.1
LNE	**-1.3**	18.0	**1.7**	64.4	**-1.4**	21.8	**32**	209	**1.4**	24.8	**0.1**	20.5	**-0.9**	24.3	**-2.0**	24.4	**0.1**	18.0
NPL	**-7.2**	11.0	**-4.2**	62.7	**-7.3**	16.3	**26**	209	**-4.5**	20.2	**-5.8**	14.4	**-6.8**	19.5	**-7.9**	19.6	**-5.8**	10.6
PTB	**3.3**	13.0	**6.3**	63.2	**3.2**	18.0	**37**	209	**6.0**	21.5	**4.7**	16.3	**3.7**	20.9	**2.6**	21.0	**4.7**	13.0
NMIA	**2.1**	66.8	**5.1**	91.3	**2.0**	68.3	**36**	219	**4.8**	69.4	**3.5**	67.9	**2.5**	69.2	**1.4**	69.2	**3.5**	67.2
MSL	**4.6**	6.6	**7.6**	62.6	**4.5**	15.8	**38**	209	**7.3**	19.8	**6.0**	13.9	**5.0**	19.1	**3.9**	19.2	**6.0**	9.8
NMISA	**-53**	581	**-50**	584	**-53**	581	**-20**	617	**-50**	581	**-52**	581	**-53**	581	**-54**	581	**-52**	581
SP	**-1.6**	10.0	**1.4**	63.1	**-1.7**	17.5	**32**	209	**1.1**	21.2	**-0.2**	15.8	**-1.2**	20.5	**-2.3**	20.6	**-0.2**	12.4
METAS	**2.9**	22.8	**5.9**	65.8	**2.8**	25.7	**36**	210	**5.6**	28.3	**4.3**	24.6	**3.3**	27.8	**2.2**	27.9	**4.3**	22.5
INRIM	**2.5**	19.3	**5.5**	65.2	**2.4**	24.1	**36**	209	**5.2**	26.8	**3.9**	22.8	**2.9**	26.3	**1.8**	26.4	**3.9**	20.6
VSL	**-32.3**	36.3	**-29.3**	71.6	**-32.4**	38.1	**1**	212	**-29.6**	39.9	**-30.9**	37.4	**-31.9**	39.6	**-33.0**	39.7	**-30.9**	36.1
KRISS	**-1.5**	12.4	**1.5**	63.5	**-1.6**	19.0	**32**	209	**1.2**	22.4	**-0.1**	17.4	**-1.1**	21.8	**-2.2**	21.9	**-0.1**	14.4
NIM	**-0.6**	8.3	**2.4**	62.8	**-0.7**	16.6	**33**	209	**2.1**	20.4	**0.8**	14.8	**-0.2**	19.8	**-1.3**	19.9	**0.8**	11.1
VNIIM	**0.0**	7.3	**3.0**	62.3	**-0.1**	14.7	**33**	209	**2.7**	18.9	**1.4**	12.6	**0.4**	18.2	**-0.7**	18.3	**1.4**	7.9
INTI	**-7.5**	12.6	**-4.5**	63.5	**-7.6**	19.1	**26**	209	**-4.8**	22.5	**-6.1**	17.6	**-7.1**	21.9	**-8.2**	22.0	**-6.1**	14.6
INMETRO	**-4.2**	11.8	**-1.2**	63.4	**-4.3**	18.6	**29**	209	**-1.5**	22.1	**-2.8**	17.0	**-3.8**	21.5	**-4.9**	21.6	**-2.8**	13.9
UTE	**-4.3**	35.5	**-1.3**	71.7	**-4.4**	38.3	**29**	212	**-1.6**	40.1	**-2.9**	37.5	**-3.9**	39.8	**-5.0**	39.8	**-2.9**	36.2
CENAM	**3.7**	16.0	**6.7**	64.3	**3.6**	21.5	**37**	209	**6.4**	24.6	**5.1**	20.1	**4.1**	24.0	**3.0**	24.1	**5.1**	17.6
MIRS/SIQ	**-10.7**	12.0	**-7.8**	62.9	**-10.8**	17.0	**23**	209	**-8.0**	20.8	**-9.3**	15.1	**-10.3**	20.1	**-11.4**	20.2	**-9.3**	11.7
SMU	**-28.4**	37.8	**-25.4**	72.4	**-28.5**	39.7	**5**	212	**-25.7**	41.4	**-27.0**	38.9	**-28.0**	41.1	**-29.1**	41.1	**-27.0**	37.7
VMT/PFI	**-1.8**	8.9	**1.1**	62.4	**-1.9**	15.0	**32**	209	**0.9**	19.2	**-0.4**	12.8	**-1.4**	18.4	**-2.5**	18.5	**-0.4**	8.5
MIKES	**-1.8**	11.4	**1.1**	62.8	**-1.9**	16.5	**32**	209	**0.9**	20.4	**-0.4**	14.5	**-1.4**	19.7	**-2.5**	19.8	**-0.4**	11.0
MKEH	**2.0**	9.2	**5.0**	62.4	**2.0**	15.1	**36**	209	**4.7**	19.2	**3.5**	12.8	**2.5**	18.4	**1.4**	18.6	**3.5**	8.6
CMI	**6.7**	30.8	**9.6**	69.0	**6.6**	33.0	**40**	211	**9.3**	35.1	**8.1**	32.0	**7.1**	34.6	**6.0**	34.7	**8.1**	30.6
INM(RO)	**-44.9**	44.5	**-41.9**	76.1	**-45.0**	46.0	**-12**	213	**-42.2**	47.6	**-43.5**	45.4	**-44.5**	47.3	**-45.6**	47.3	**-43.5**	44.4
NML(IE)	**-3.0**	62.3			**-3.0**	63.4	**30**	218	**-0.3**	64.5	**-1.5**	62.9	**-2.6**	64.3	**-3.6**	64.3	**-1.5**	62.2
JV	**0.1**	14.4	**3.0**	63.4			**34**	209	**2.8**	22.2	**1.5**	16.9	**0.5**	21.5	**-0.6**	21.6	**1.5**	14.0
IPQ	**-33**	209	**-30**	218	**-34**	209			**-31**	209	**-32**	209	**-33**	209	**-34**	209	**-32**	209
SMD	**-2.7**	18.6	**0.3**	64.5	**-2.8**	22.2	**31**	209			**-1.3**	20.7	**-2.3**	24.6	**-3.4**	24.7	**-1.3**	18.4
UME	**-1.4**	12.2	**1.5**	62.9	**-1.5**	16.9	**32**	209	**1.3**	20.7			**-1.0**	20.0	**-2.1**	20.1	**0.0**	11.6
EIM	**-0.4**	17.9	**2.6**	64.3	**-0.5**	21.5	**33**	209	**2.3**	24.6	**1.0**	20.0			**-1.1**	24.1	**1.0**	17.6
BEV	**0.7**	18.1	**3.6**	64.3	**0.6**	21.6	**34**	209	**3.4**	24.7	**2.1**	20.1	**1.1**	24.1			**2.1**	17.7
CEM	**-1.4**	7.3	**1.5**	62.2	**-1.5**	14.0	**32**	209	**1.3**	18.4	**0.0**	11.6	**-1.0**	17.6	**-2.1**	17.7		