

CCT-K4, EUROMET.T-K4, EURAMET.T-K3.3, APMP.T-K4 and EURAMET.T-K3.5

Key comparison CCT-K4

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

$T_i - T_{mc}$ difference of Al fixed-point temperature realized at laboratory i , T_i , relative to the master circulated cell (PTB/NIST Al 94-3) temperature T_{mc}

Cell designation of Al cell at laboratory i

u_i combined standard uncertainty of laboratory i

$u_c = 0.5$ mK standard uncertainty representing the stability of the circulated cells

Lab i	Cell	$T_i - T_{mc}$ / mK	u_i / mK	$(u_i^2 + u_c^2)^{1/2}$ / mK
BNM-INM*	Al 123	3.87	0.51	0.72
IMGC**	Al Co3	4.62	0.50	0.71
KRISS	Al	1.36	0.90	1.03
NIM	Al 1	3.49	0.90	1.03
NIST	Al 94-2	4.63	0.19	0.54
NMi-VSL	93T267	-0.74	1.93	1.99
CSIRO-NML	Al 98/2	5.55	0.44	0.67
NPL	Al 89	1.37	0.98	1.10
NRC	Al-6	4.18	0.50	0.71
NMIJ	Al 97-1	1.83	0.61	0.79
PTB	Al 97-2	2.87	0.55	0.75
VNIIM	Al	2.12	0.71	0.87

Key comparison EUROMET.T-K4

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

$T_i - T_{PTB}$ difference of Al fixed-point temperature realized at laboratory i , T_i , relative to the PTB result. PTB is the Pilot Laboratory and is the only laboratory with measurements in the four loops organized in key comparison EUROMET.T-K4 - see Section 5.2 of the EUROMET.T-K4 Final Report -

$U_{Lab\ i}$ expanded uncertainty ($k = 2$) of $T_i - T_{PTB}$

Lab i	$T_i - T_{PTB}$ / mK	$U_{Lab\ i}$ / mK
DTI	-1.45	5.65
JV	-1.42	4.69
MKEH	-5.60	4.04
SMU	0.52	3.65
INM(RO)	-6.63	3.77
UME	-2.08	4.34
DZM/FSB	-5.26	12.62
CMI	-1.30	4.49
GUM	1.58	3.88
LNE-INM*	1.92	3.54
MIRS	-3.20	3.64
METAS	3.42	3.04

Lab i	$T_i - T_{PTB}$ / mK	$U_{Lab\ i}$ / mK
BEV	0.45	4.31
NPL	-0.89	2.81
SP	0.67	3.46
VMT/PFI	0.67	4.24
VNIIM	0.86	2.86
MIKES	-2.34	4.55
EIM	-14.82	5.99
INRIM**	-3.21	4.62
IPQ	-1.84	4.42
CEM	-1.53	7.49
NMi-VSL	-0.47	4.63
PTB	0.00	3.36

* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4

** INRIM was named "IMGC" at the time of key comparison CCT-K4

Key comparison EURAMET.T-K3.3 (bilateral comparison between CEM and LACOMET carried out in 2009)

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

$T_{LACOMET} - T_{CEM} = 0.8$ mK and $U(T_{LACOMET} - T_{CEM}) = 5.4$ mK (see on page 14 of the EURAMET.T-K3.3 Final Report)

U is the expanded uncertainty considering a coverage factor k equal to 2.

Key comparison APMP.T-K4

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

$T_i - T_{\text{KRISS}}$ difference of Al fixed-point temperature realized at laboratory i , T_i , relative to the KRISS result. KRISS is the Pilot Laboratory and is the only laboratory with measurements in the two loops organized in key comparison APMP.T-K4 (see page 4 of the APMP.T-K4 Final Report)

$U_{\text{Lab}i}$ expanded uncertainty ($k=2$) of $T_i - T_{\text{KRISS}}$

Lab i	$T_i - T_{\text{KRISS}}$ / mK	$U_{\text{Lab}i}$ / mK
KRISS	0.00	5.10
NMIJ	2.20	4.70
SCL	4.18	4.56
NMC, A*STAR	6.04	6.02
CMS	-0.07	5.46
NIMT	-0.43	8.28
NML-SIRIM	-11.34	7.70
NPLI	5.83	5.12

Key comparison EURAMET.T-K3.5 (bilateral comparison between VSL and ROTH+CO.AG carried out in 2013)

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

$T_{\text{ROTH+CO.AG}} - T_{\text{VSL}} = 4.69$ mK and $U(T_{\text{ROTH+CO.AG}} - T_{\text{VSL}}) = 4.81$ mK (see on page 11 of the EURAMET.T-K3.5 Final Report)

U is the expanded uncertainty considering a coverage factor k equal to 2.

CCT-K4, EUROMET.T-K4, EURAMET.T-K3.3, APMP.T-K4 and EURAMET.T-K3.5

Key comparison CCT-K4

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

Key comparison reference value for the nominal temperature of Al fixed point:
the key comparison reference temperature, T_R , is the weighted average temperature calculated using the sum ($u_i^2 + u_c^2$) of the squared uncertainties to set the weights. It has zero uncertainty by definition.

The degree of equivalence of each laboratory with respect to the key comparison reference value is given by a pair of terms:

$D_i = (T_i - T_R)$ and U_i , its expanded uncertainty at a 95% level of confidence, both expressed in mK.

$U_i = [(2u_c)^2 + U_{\text{Lab } i}^2]^{1/2}$, where $U_{\text{Lab } i}$ is the expanded uncertainty of laboratory i at a 95% level of confidence.

The degree of equivalence between two laboratories is given by a pair of terms: $D_{ij} = D_i - D_j = T_i - T_j$ and U_{ij} , its expanded uncertainty at a 95% level of confidence (equations 1 to 3 of the CCT-K4 Final Report, pages 22 to 23), both expressed in mK.

Linking EUROMET.T-K4 results to those of CCT-K4

The reference value T_{EUR} of key comparison EUROMET.T-K4 is computed as the simple mean of the EUROMET.T-K4 participants' results, the EIM result being eliminated as an obvious outlier.

The expanded uncertainty ($k = 2$) is calculated from the uncertainties of the laboratories.

$T_{\text{EUR}} = T_{\text{PTB}} - (1.18 \pm 1.06)$ mK, ($k = 2$)

The linkage of EUROMET.T-K4 results to those of CCT-K4 is explained in Section 5.4 of the EUROMET.T-K4 Final Report, and is based on the results of common participants to both comparisons: INRIM, LNE-INM, NPL, PTB, VNIIM, and NMi-VSL.

$T_{\text{EUR}} = T_R + (1.65 \pm 2.28)$ mK, ($k = 2$)

This equation allows to deduce the degrees of equivalence of the EUROMET.T-K4 participants relative to the CCT-K4 key comparison reference value, each composed of the offset D_i and its expanded uncertainty U_i ($k = 2$), expressed in mK.

The pair-wise degrees of equivalence inside key comparison EUROMET.T-K4 are composed of two terms D_{ij} and its expanded uncertainty U_{ij} ($k = 2$), expressed in mK, computed as explained in Section 7 of the EUROMET.T-K4 Final Report.

CCT-K4, EUROMET.T-K4, EURAMET.T-K3.3, APMP.T-K4 and EURAMET.T-K3.5

Linking EURAMET.T-K3.3 results to those of CCT-K4

The LACOMET result obtained in EURAMET.T-K3.3 is linked to the results of CCT-K4 using the participation of CEM in EUROMET.T-K4, whose results are linked to those of CCT-K4, as described above.

Linking APMP.T-K4 results to those of CCT-K4

The participants' results obtained in APMP.T-K4 are linked to the results of CCT-K4 using the common participation of KRISS and NMIJ in both key comparisons. The linkage process is explained in section 4.2 of the APMP.T-K4 Final Report, and leads to the computation of the degrees of equivalence of participants in APMP.T-K4 relative to the CCT-K4 reference value.

Linking EURAMET.T-K3.5 results to those of CCT-K4

The ROTH+CO.AG result obtained in EURAMET.T-K3.5 is linked to the results of CCT-K4 using the participation of VSL in EUROMET.T-K4, whose results are linked to those of CCT-K4, as described above.

CCT-K4, EUROMET.T-K4, EURAMET.T-K3.3, APMP.T-K4 and EURAMET.T-K3.5

Comparison of local realizations of aluminium freezing-point temperature

MEASURAND: Freezing-point temperature of Al fixed-point cells

NOMINAL TEMPERATURE: 660.323 °C

Degrees of equivalence relative to the CCT-K4 key comparison reference value

Lab <i>i</i>	D_i / mK	U_i / mK	Lab <i>i</i>	D_i / mK	U_i / mK	Lab <i>i</i>	D_i / mK	U_i / mK	Lab <i>i</i>	D_i / mK	U_i / mK
BNM-INM	0.25	1.47	DTI	1.38	6.00	BEV	3.28	4.76	KRISS	-3.13	6.39
IMGC	1.00	1.44	JV	1.41	5.10	NPL	1.94	3.47	NMIJ	-0.92	6.09
KRISS	-2.26	2.13	MKEH	-2.77	4.52	SP	3.50	4.00	SCL	1.05	5.97
NIM	-0.13	3.49	SMU	3.35	4.18	VMT/PFI	3.50	4.70	NMC, A*STAR	2.92	7.91
NIST	1.01	1.08	INM(RO)	-3.80	4.27	VNIIM	3.69	3.50	CMS	-3.19	11.42
NMi-VSL	-4.35	4.16	UME	0.75	4.79	MIKES	0.49	4.98	NIMT	-3.56	10.72
CSIRO-NML	1.93	1.51	DZM/FSB	-2.43	12.78	EIM	-11.99	6.33	NML-SIRIM	-14.46	9.31
NPL	-2.25	2.39	CMI	1.53	4.92	INRIM**	-0.38	5.04	NPLI	2.70	6.20
NRC	0.56	1.46	GUM	4.41	4.37	IPQ	0.99	4.86			
NMIJ	-1.79	1.60	LNE-INM*	4.75	4.08	CEM	1.30	7.75	ROTH+CO.AG	7.44	6.97
PTB	-0.75	1.54	MIRS	-0.37	4.16	NMi-VSL	2.36	5.05			
VNIIM	-1.50	1.82	METAS	6.25	3.65	PTB	2.83	3.92			
						LACOMET	2.1	9.7			

* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4

** INRIM was named "IMGC" at the time of key comparison CCT-K4

Black: participants in CCT-K4

Green: participants in EUROMET.T-K4

Blue: participant in EURAMET.T-K3.3

Pink: participants in APMP.T-K4

Brown: participant in EURAMET.T-K3.5

Pair-wise degrees of equivalence inside CCT-K4

Lab *j* →

Lab <i>i</i> ↓	D_i / mK		U_i / mK		BNM-INM		IMGC		KRISS		NIM		NIST		NMI-VSL	
	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK
BNM-INM	0.25	1.47					-0.75	3.12	2.51	3.44	0.38	4.54	-0.76	2.78	4.60	4.41
IMGC	1.00	1.44	0.75	3.12					3.26	2.77	1.13	4.15	-0.01	1.48	5.35	4.99
KRISS	-2.26	2.13	-2.51	3.44	-3.26	2.77					-2.14	3.86	-3.27	2.39	2.09	5.13
NIM	-0.13	3.49	-0.38	4.54	-1.13	4.15	2.14	3.86					-1.14	3.90	4.23	5.98
NIST	1.01	1.08	0.76	2.78	0.01	1.48	3.27	2.39	1.14	3.90					5.36	4.78
NMI-VSL	-4.35	4.16	-4.60	4.41	-5.35	4.99	-2.09	5.13	-4.23	5.98	-5.36	4.78				
CSIRO-NML	1.93	1.51	1.69	3.27	0.93	2.70	4.20	2.23	2.06	3.81	0.92	2.30	6.29	5.09		
NPL	-2.25	2.39	-2.50	1.86	-3.25	2.97	0.01	3.22	-2.13	4.45	-3.26	2.62	2.10	4.31		
NRC	0.56	1.46	0.31	3.12	-0.44	2.05	2.82	2.78	0.69	4.15	-0.45	1.49	4.91	4.99		
NMIJ	-1.79	1.60	-2.04	3.31	-2.79	2.75	0.48	2.29	-1.66	3.84	-2.80	2.36	2.57	5.11		
PTB	-0.75	1.54	-1.00	2.99	-1.75	2.11	1.52	2.35	-0.62	3.88	-1.76	1.57	3.61	4.67		
VNIIM	-1.50	1.82	-1.75	2.34	-2.50	3.30	0.76	3.51	-1.38	4.67	-2.51	2.98	2.85	4.54		

Lab <i>i</i> ↓	D_i / mK		U_i / mK		CSIRO-NML		NPL		NRC		NMIJ		PTB		VNIIM	
	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK
BNM-INM	0.25	1.47	-1.69	3.27	2.50	1.86	-0.31	3.12	2.04	3.31	1.00	2.99	1.75	2.34		
IMGC	1.00	1.44	-0.93	2.70	3.25	2.97	0.44	2.05	2.79	2.75	1.75	2.11	2.50	3.30		
KRISS	-2.26	2.13	-4.20	2.23	-0.01	3.22	-2.82	2.78	-0.48	2.29	-1.52	2.35	-0.76	3.51		
NIM	-0.13	3.49	-2.06	3.81	2.13	4.45	-0.69	4.15	1.66	3.84	0.62	3.88	1.38	4.67		
NIST	1.01	1.08	-0.92	2.30	3.26	2.62	0.45	1.49	2.80	2.36	1.76	1.57	2.51	2.98		
NMI-VSL	-4.35	4.16	-6.29	5.09	-2.10	4.31	-4.91	4.99	-2.57	5.11	-3.61	4.67	-2.85	4.54		
CSIRO-NML	1.93	1.51			4.19	3.56	1.38	2.71	3.72	2.20	2.68	2.26	3.44	3.45		
NPL	-2.25	2.39	-4.19	3.56			-2.81	2.98	-0.47	3.18	-1.51	2.58	-0.75	2.15		
NRC	0.56	1.46	-1.38	2.71	2.81	2.98			2.35	2.76	1.31	2.12	2.06	3.30		
NMIJ	-1.79	1.60	-3.72	2.20	0.47	3.18	-2.35	2.76			-1.04	2.32	-0.29	3.49		
PTB	-0.75	1.54	-2.68	2.26	1.51	2.58	-1.31	2.12	1.04	2.32			0.76	2.95		
VNIIM	-1.50	1.82	-3.44	3.45	0.75	2.15	-2.06	3.30	0.29	3.49	-0.76	2.95				

Key comparison EUROMET.T-K4 Freezing-point temperature of Al fixed-point cells
 Pair-wise degrees of equivalence inside EUROMET.T-K4

660.323 °C

Lab <i>i</i>	D_i / mK		U_i / mK		Lab <i>j</i> →																
	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	DTI		JV		MKEH		SMU		INM(RO)		UME		DZM/FSB		CMI		
DTI	1.38	6.00																			
JV	1.41	5.10	0.03	7.18																	
MKEH	-2.77	4.52	-4.15	6.78	-4.18	6.00															
SMU	3.35	4.18	1.97	6.56	1.94	5.75	6.12	5.24													
INM(RO)	-3.80	4.27	-5.18	6.62	-5.21	5.82	-1.03	5.31	-7.15	5.03											
UME	0.75	4.79	-0.63	6.97	-0.66	6.21	3.52	5.74	-2.60	5.47	4.55	5.55									
DZM/FSB	-2.43	12.78	-3.81	13.74	-3.84	13.37	0.34	13.16	-5.78	13.05	1.37	13.08	-3.18	13.26							
CMI	1.53	4.92	0.15	7.06	0.12	6.31	4.30	5.85	-1.82	5.59	5.33	5.66	0.78	6.06	3.96	13.30					
GUM	4.41	4.37	3.03	6.69	3.00	5.68	7.18	5.16	1.06	4.87	8.21	5.19	3.66	5.62	6.84	13.11	2.88	5.52			
LNE-INM	4.75	4.08	3.37	6.50	3.34	5.74	7.52	4.83	1.40	5.45	8.55	4.45	4.00	5.34	7.18	13.22	3.22	5.10			
MIRS	-0.37	4.16	-1.75	6.55	-1.78	5.74	2.40	5.23	-3.72	4.94	3.43	5.01	-1.12	5.46	2.06	13.04	-1.90	5.58			
METAS	6.25	3.65	4.87	6.24	4.84	5.38	9.02	4.83	2.90	4.51	10.05	4.60	5.50	5.08	8.68	12.89	4.72	5.21			
BEV	3.28	4.76	1.90	6.95	1.87	6.19	6.05	5.72	-0.07	5.45	7.08	5.52	2.53	5.93	-9.56	13.25	1.75	6.04			
NPL	1.94	3.47	0.56	6.13	0.53	5.25	4.71	4.69	-1.41	4.37	5.74	4.45	1.19	4.95	4.37	12.84	0.41	5.08			
SP	3.50	4.00	2.12	6.45	2.09	5.62	6.27	5.10	0.15	4.80	7.30	4.88	2.75	5.34	5.93	12.99	1.97	5.46			
VMT/PFI	3.50	4.70	2.12	6.91	2.09	6.14	6.27	5.67	0.15	5.40	7.30	5.47	2.75	5.88	5.93	13.22	1.97	5.99			
VNIIM	3.69	3.50	2.31	6.15	2.28	5.27	6.46	4.72	0.34	4.39	7.49	4.48	2.94	4.97	6.12	12.85	2.16	5.10			
MIKES	0.49	4.98	-0.89	7.10	-0.92	6.36	3.26	5.90	-2.86	5.65	4.29	5.71	-0.26	6.11	2.92	13.33	-1.04	6.22			
EIM	-11.99	6.33	-13.37	8.10	-13.40	7.46	-9.22	7.07	-15.34	6.86	-8.19	6.92	-12.74	7.25	-9.56	13.89	-13.52	7.34			
INRIM	-0.38	5.04	-1.76	7.15	-1.79	6.41	2.39	5.95	-3.73	5.70	3.42	5.77	-1.13	6.16	2.05	13.35	-1.91	6.27			
IPQ	0.99	4.86	-0.39	7.01	-0.42	6.26	3.76	5.80	-2.36	5.54	4.79	5.61	0.24	6.01	3.42	13.28	-0.54	6.12			
CEM	1.30	7.75	-0.08	9.26	-0.11	8.70	4.07	8.37	-2.05	8.20	5.10	8.24	0.55	8.52	3.73	14.59	-0.23	8.60			
NMI-VSL	2.36	5.05	0.98	7.15	0.95	6.41	5.13	5.96	-0.99	5.71	6.16	5.78	1.61	6.17	4.79	13.35	0.83	6.27			
PTB	2.83	3.92	1.45	6.40	1.42	5.57	5.60	5.04	-0.52	4.74	6.63	4.82	2.08	5.28	5.26	12.97	1.30	5.40			

Key comparison EUROMET.T-K4 Freezing-point temperature of Al fixed-point cells
 Pair-wise degrees of equivalence inside EUROMET.T-K4 (Continue)

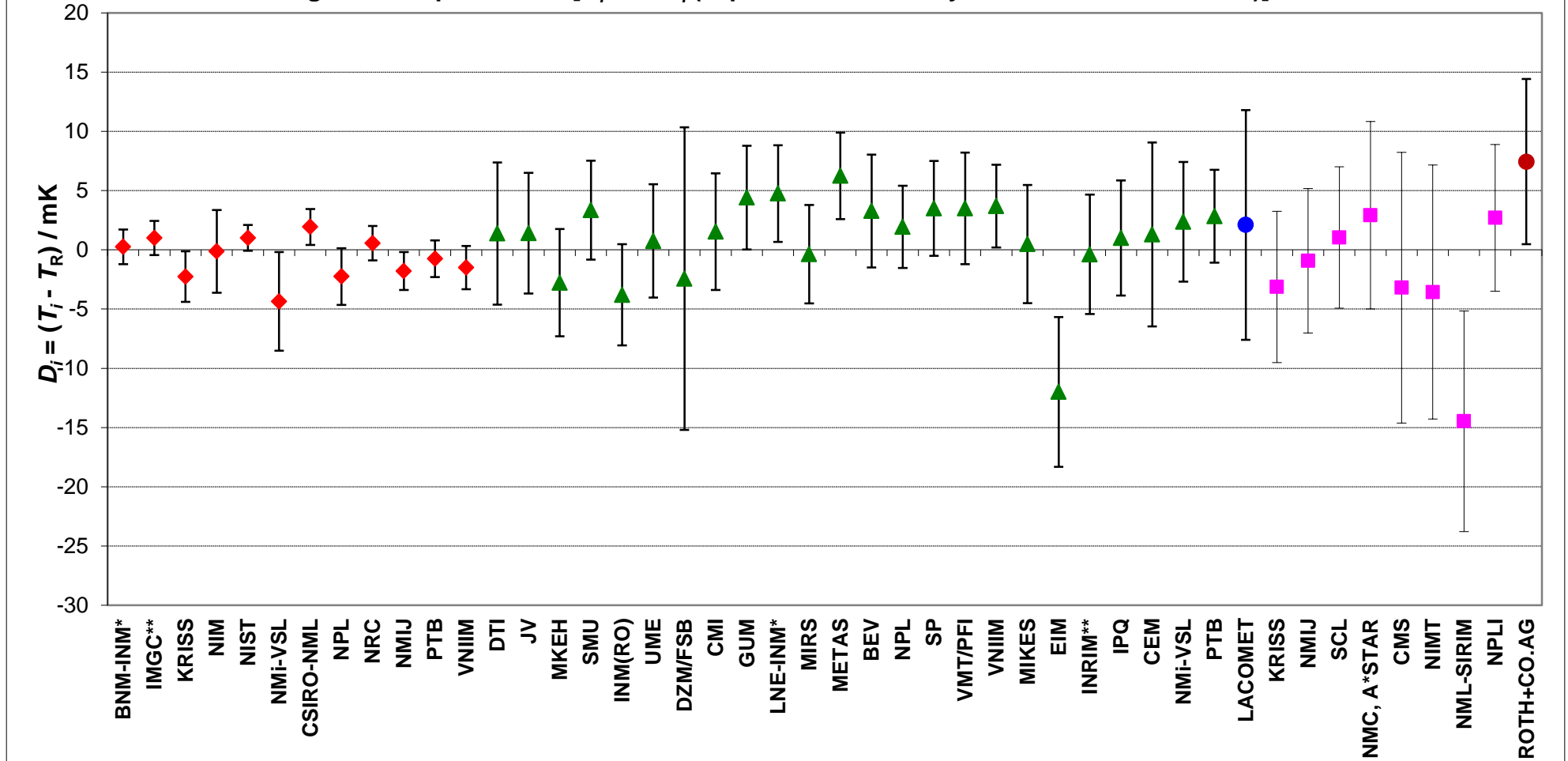
660.323 °C

Lab <i>i</i>			Lab <i>j</i> →															
	<i>D_i</i> / mK	<i>U_i</i> / mK	GUM		LNE-INM		MIRS		METAS		BEV		NPL		SP		VMT/PFI	
			<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK
DTI	1.38	6.00	-3.03	6.69	-3.37	6.50	1.75	6.55	-4.87	6.24	-1.90	6.95	-0.56	6.13	-2.12	6.45	-2.12	6.91
JV	1.41	5.10	-3.00	5.68	-3.34	5.74	1.78	5.74	-4.84	5.38	-1.87	6.19	-0.53	5.25	-2.09	5.62	-2.09	6.14
MKEH	-2.77	4.52	-7.18	5.16	-7.52	4.83	-2.40	5.23	-9.02	4.83	-6.05	5.72	-4.71	4.69	-6.27	5.10	-6.27	5.67
SMU	3.35	4.18	-1.06	4.87	-1.40	5.45	3.72	4.94	-2.90	4.51	0.07	5.45	1.41	4.37	-0.15	4.80	-0.15	5.40
INM(RO)	-3.80	4.27	-8.21	5.19	-8.55	4.45	-3.43	5.01	-10.05	4.60	-7.08	5.52	-5.74	4.45	-7.30	4.88	-7.30	5.47
UME	0.75	4.79	-3.66	5.62	-4.00	5.34	1.12	5.46	-5.50	5.08	-2.53	5.93	-1.19	4.95	-2.75	5.34	-2.75	5.88
DZM/FSB	-2.43	12.78	-6.84	13.11	-7.18	13.22	-2.06	13.04	-8.68	12.89	9.56	13.25	-4.37	12.84	-5.93	12.99	-5.93	13.22
CMI	1.53	4.92	-2.88	5.52	-3.22	5.10	1.90	5.58	-4.72	5.21	-1.75	6.04	-0.41	5.08	-1.97	5.46	-1.97	5.99
GUM	4.41	4.37			-0.34	5.79	4.78	5.10	-1.84	4.69	1.13	5.60	2.47	4.55	0.91	4.97	0.91	5.55
LNE-INM	4.75	4.08	0.34	5.79			5.12	4.85	-1.50	12.97	2.39	5.38	2.81	4.27	1.25	4.72	1.25	5.32
MIRS	-0.37	4.16	-4.78	5.10	-5.12	4.85			-6.62	4.50	-3.65	5.44	-2.31	4.35	-3.87	4.79	-3.87	5.39
METAS	6.25	3.65	1.84	4.69	1.50	12.97	6.62	4.50			2.97	5.06	4.31	3.86	2.75	4.35	2.75	5.00
BEV	3.28	4.76	-1.13	5.60	-2.39	5.38	3.65	5.44	-2.97	5.06			1.34	4.93	-0.22	5.32	1.63	5.86
NPL	1.94	3.47	-2.47	4.55	-2.81	4.27	2.31	4.35	-4.31	3.86	-1.34	4.93			-1.56	4.20	0.29	4.87
SP	3.50	4.00	-0.91	4.97	-1.25	4.72	3.87	4.79	-2.75	4.35	0.22	5.32	1.56	4.20			1.85	5.26
VMT/PFI	3.50	4.70	-0.91	5.55	-1.25	5.32	3.87	5.39	-2.75	5.00	-1.63	5.86	-0.29	4.87	-1.85	5.26		
VNIIM	3.69	3.50	-0.72	4.58	-1.06	4.29	4.06	4.37	-2.56	3.89	0.41	4.95	1.75	3.72	0.19	4.22	0.19	4.89
MIKES	0.49	4.98	-3.92	5.79	-4.26	5.57	0.86	5.63	-5.76	5.27	-2.79	6.09	-1.45	5.14	-3.01	5.52	-3.01	6.04
EIM	-11.99	6.33	-16.40	6.98	-16.74	6.80	-11.62	6.85	-18.24	6.55	-15.27	7.23	-13.93	6.45	-15.49	6.76	-15.49	7.19
INRIM	-0.38	5.04	-4.79	5.84	-5.13	5.63	-0.01	5.69	-6.63	5.33	-3.66	6.14	-2.32	5.20	-3.88	5.57	-3.88	6.09
IPQ	0.99	4.86	-3.42	5.68	-3.76	5.46	1.36	5.52	-5.26	5.15	-2.29	5.99	-0.95	5.02	-2.51	5.41	-2.51	5.94
CEM	1.30	7.75	-3.11	8.30	-3.45	8.14	1.67	8.19	-4.95	7.94	-1.98	8.51	-0.64	7.86	-2.20	8.11	-2.20	8.47
NMi-VSL	2.36	5.05	-2.05	5.85	-2.39	5.64	2.73	5.70	-3.89	5.34	-0.92	4.93	0.42	5.21	-1.14	5.58	-1.14	6.10
PTB	2.83	3.92	-1.58	4.91	-1.92	4.65	3.20	4.72	-3.42	4.28	-0.45	5.26	0.89	4.12	-0.67	4.58	-0.67	5.20

Pair-wise degrees of equivalence inside EUROMET.T-K4 (Continue)

Lab <i>i</i>			Lab <i>j</i> →															
	<i>D_i</i> / mK	<i>U_i</i> / mK	VNIIM		MIKES		EIM		INRIM		IPQ		CEM		NMI-VSL		PTB	
			<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK
DTI	1.38	6.00	-2.31	6.15	0.89	7.10	13.37	8.10	1.76	7.15	0.39	7.01	0.08	9.26	-0.98	7.15	-1.45	6.40
JV	1.41	5.10	-2.28	5.27	0.92	6.36	13.40	7.46	1.79	6.41	0.42	6.26	0.11	8.70	-0.95	6.41	-1.42	5.57
MKEH	-2.77	4.52	-6.46	4.72	-3.26	5.90	9.22	7.07	-2.39	5.95	-3.76	5.80	-4.07	8.37	-5.13	5.96	-5.60	5.04
SMU	3.35	4.18	-0.34	4.39	2.86	5.65	15.34	6.86	3.73	5.70	2.36	5.54	2.05	8.20	0.99	5.71	0.52	4.74
INM(RO)	-3.80	4.27	-7.49	4.48	-4.29	5.71	8.19	6.92	-3.42	5.77	-4.79	5.61	-5.10	8.24	-6.16	5.78	-6.63	4.82
UME	0.75	4.79	-2.94	4.97	0.26	6.11	12.74	7.25	1.13	6.16	-0.24	6.01	-0.55	8.52	-1.61	6.17	-2.08	5.28
DZM/FSB	-2.43	12.78	-6.12	12.85	-2.92	13.33	9.56	13.89	-2.05	13.35	-3.42	13.28	-3.73	14.59	-4.79	13.35	-5.26	12.97
CMI	1.53	4.92	-2.16	5.10	1.04	6.22	13.52	7.34	1.91	6.27	0.54	6.12	0.23	8.60	-0.83	6.27	-1.30	5.40
GUM	4.41	4.37	0.72	4.58	3.92	5.79	16.40	6.98	4.79	5.84	3.42	5.68	3.11	8.30	2.05	5.85	1.58	4.91
LNE-INM	4.75	4.08	1.06	4.29	4.26	5.57	16.74	6.80	5.13	5.63	3.76	5.46	3.45	8.14	2.39	5.64	1.92	4.65
MIRS	-0.37	4.16	-4.06	4.37	-0.86	5.63	11.62	6.85	0.01	5.69	-1.36	5.52	-1.67	8.19	-2.73	5.70	-3.20	4.72
METAS	6.25	3.65	2.56	3.89	5.76	5.27	18.24	6.55	6.63	5.33	5.26	5.15	4.95	7.94	3.89	5.34	3.42	4.28
BEV	3.28	4.76	-0.41	4.95	2.79	6.09	15.27	7.23	3.66	6.14	2.29	5.99	1.98	8.51	0.92	4.93	0.45	5.26
NPL	1.94	3.47	-1.75	3.72	1.45	5.14	13.93	6.45	2.32	5.20	0.95	5.02	0.64	7.86	-0.42	5.21	-0.89	4.12
SP	3.50	4.00	-0.19	4.22	3.01	5.52	15.49	6.76	3.88	5.57	2.51	5.41	2.20	8.11	1.14	5.58	0.67	4.58
VMT/PFI	3.50	4.70	-0.19	4.89	3.01	6.04	15.49	7.19	3.88	6.09	2.51	5.94	2.20	8.47	1.14	6.10	0.67	5.20
VNIIM	3.69	3.50			3.20	5.16	15.68	6.47	4.07	5.22	2.70	5.04	2.39	7.87	1.33	5.23	0.86	4.15
MIKES	0.49	4.98	-3.20	5.16			12.48	7.38	0.87	6.31	-0.50	6.17	-0.81	8.63	-1.87	6.32	-2.34	5.46
EIM	-11.99	6.33	-15.68	6.47	-12.48	7.38			-11.61	7.42	-12.98	7.29	-13.64	9.47	-14.35	7.43	-14.82	5.90
INRIM	-0.38	5.04	-4.07	5.22	-0.87	6.31	11.61	7.42			-1.37	6.22	-1.68	8.67	-2.74	6.37	-3.21	5.52
IPQ	0.99	4.86	-2.70	5.04	0.50	6.17	12.98	7.29	1.37	6.22			-0.31	8.56	-1.37	6.22	-1.84	5.35
CEM	1.30	7.75	-2.39	7.87	0.81	8.63	13.64	9.47	1.68	8.67	0.31	8.56			-1.06	8.67	-1.53	8.07
NMI-VSL	2.36	5.05	-1.33	5.23	1.87	6.32	14.35	7.43	2.74	6.37	1.37	6.22	1.06	8.67			-0.47	5.52
PTB	2.83	3.92	-0.86	4.15	2.34	5.46	14.82	5.90	3.21	5.52	1.84	5.35	1.53	8.07	0.47	5.52		

CCT-K4, EUROMET.T-K4, EURAMET.T-K3.3 & K3.5, and APMP.T-K4
Freezing-point temperature of Al fixed-point cells - Nominal temperature: 660.323 °C
Degrees of equivalence: [D_i and U_i (expanded uncertainty at 95% confidence level)]



* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4

** INRIM was named "IMGC" at the time of key comparison CCT-K4

Red diamonds: participants in CCT-K4

Green triangles: participants in EUROMET.T-K4

Blue and brown circles: participants in EURAMET.T-K3.3 and K3.5, respectively

Pink squares: participant in APMP.T-K4

CCT-K4 and EUROMET.T-K4

Key comparison CCT-K4

Comparison of local realizations of silver freezing-point temperature

MEASURAND: Freezing-point temperature of Ag fixed-point cells

NOMINAL TEMPERATURE: 961.78 °C

$T_i - T_{mc}$ difference of Ag fixed-point temperature realized at laboratory i , T_i , relative to the master circulated cell (PTB Ag 6) temperature T_{mc}

Cell designation of Ag cell at laboratory i

u_i combined standard uncertainty of laboratory i

$u_c = 0.2$ mK standard uncertainty representing the stability of the circulated cells

Lab i	Cell	$T_i - T_{mc}$ / mK	u_i / mK	$(u_i^2 + u_c^2)^{1/2}$ / mK
BNM-INM	Ag 105	-3.96	1.52	1.53
IMGC	Ag JM2	-0.42	1.17	1.18
KRISS	Ag	-0.53	1.29	1.30
NIM	Ag 9402	-4.30	1.56	1.57
NIST	Ag 92-1	-0.11	0.43	0.48
NMi-VSL	92T199	-8.39	1.93	1.94
CSIRO-NML	Ag	-14.3	6.42	6.42
NPL	Ag 8/97	-5.16	1.79	1.80
NRC	Ag-6	-0.04	2.45	2.46
NMIJ	Ag 98-1	-4.01	1.58	1.60
PTB	Ag 6	0	0.71	0.73
VNIIM	Ag	-3.43	1.08	1.10

Key comparison EUROMET.T-K4

Comparison of local realizations of silver freezing-point temperature

MEASURAND: Freezing-point temperature of Ag fixed-point cells

NOMINAL TEMPERATURE: 961.78 °C

$T_i - T_{TPV}$ difference of Ag fixed-point temperature realized at laboratory i , T_i , relative to the "Thermometer PTB Value, T_{TPV} ", as explained in Sections 6.3 and 6.4 of the EUROMET.T-K4 Final Report

$U_{Lab\ i}$ expanded uncertainty ($k = 2$) of $T_i - T_{TPV}$

Lab i	$T_i - T_{TPV}$ / mK	$U_{Lab\ i}$ / mK
CMI	-7.99	7.03
GUM	-2.72	6.34
LNE-INM*	5.90	8.57
MIRS	-1.35	8.20
METAS	-5.45	7.97
BEV	-4.48	7.57
SMU	-2.55	12.97
NPL	-2.34	13.37
SP	-2.80	14.00
VMT/PFI	7.17	14.11
VNIIM	6.47	13.64
MIKES	2.57	10.69

Lab i	$T_i - T_{TPV}$ / mK	$U_{Lab\ i}$ / mK
EIM	6.31	10.22
INRIM**	-0.62	8.57
IPQ	2.08	10.70
CEM	0.67	13.62
NMi-VSL	-0.70	8.67
PTB	-2.27	9.95

* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4

** INRIM was named "IMGC" at the time of key comparison CCT-K4

CCT-K4 and EUROMET.T-K4

Key comparison CCT-K4

Comparison of local realizations of silver freezing-point temperature

MEASURAND: Freezing-point temperature of Ag fixed-point cells
NOMINAL TEMPERATURE: 961.78 °C

Key comparison reference value for the nominal temperature of Ag fixed point:
the key comparison reference temperature, T_R , is the weighted average temperature calculated using the sum ($u_i^2 + u_c^2$) of the squared uncertainties to set the weights. It has zero uncertainty by definition.

The degree of equivalence of each laboratory with respect to the key comparison reference value is given by a pair of terms:

$D_i = (T_i - T_R)$ and U_i , its expanded uncertainty at a 95% level of confidence, both expressed in mK.

$U_i = [(2u_c)^2 + U_{\text{Lab } i}^2]^{1/2}$, where $U_{\text{Lab } i}$ is the expanded uncertainty of laboratory i at a 95% level of confidence.

The degree of equivalence between two laboratories is given by a pair of terms: $D_{ij} = D_i - D_j = T_i - T_j$ and U_{ij} , its expanded uncertainty at a 95% level of confidence (equations 1 to 3 of the CCT-K4 Final Report, pages 22 to 23), both expressed in mK.

Linking EUROMET.T-K4 results to those of CCT-K4

The reference value T_{EUR} of key comparison EUROMET.T-K4 is computed as the simple mean of the EUROMET.T-K4 participants' results.

The expanded uncertainty ($k = 2$) is calculated from the uncertainties of the laboratories.

$T_{\text{EUR}} = T_{\text{TPV}} - (0.52 \pm 1.30) \text{ mK}, (k = 2)$

The linkage of EUROMET.T-K4 results to those of CCT-K4 is explained in Section 6.6 of the EUROMET.T-K4 Final Report, and is based on the results of common participants to both comparisons: INRIM, LNE-INM, NPL, PTB, VNIIM, and NMI-VSL.

$T_{\text{EUR}} = T_R - (3.48 \pm 4.16) \text{ mK}, (k = 2)$

This equation allows to deduce the degrees of equivalence of the EUROMET.T-K4 participants relative to the CCT-K4 key comparison reference value, each composed of the offset D_i and its expanded uncertainty U_i ($k = 2$), expressed in mK.

The pair-wise degrees of equivalence inside key comparison EUROMET.T-K4 are composed of two terms D_{ij} and its expanded uncertainty U_{ij} ($k = 2$), expressed in mK, computed as explained in Section 7 of the EUROMET.T-K4 Final Report.

CCT-K4 and EUROMET.T-K4

Comparison of local realizations of silver freezing-point temperature

MEASURAND: Freezing-point temperature of Ag fixed-point cells

NOMINAL TEMPERATURE: 961.78 °C

Degrees of equivalence relative to the CCT-K4 key comparison reference value

Lab <i>i</i>	D_i / mK	U_i / mK	Lab <i>i</i>	D_i / mK	U_i / mK	Lab <i>i</i>	D_i / mK	U_i / mK
BNM-INM	-2.69	3.13	CMI	-11.35	8.07	EIM	2.95	10.96
IMGC	0.85	2.58	GUM	-6.08	7.47	INRIM**	-3.98	9.44
KRISS	0.74	2.69	LNE-INM*	2.54	9.44	IPQ	-1.28	11.41
NIM	-3.03	6.18	MIRS	-4.71	9.11	CEM	-2.69	14.18
NIST	1.16	1.01	METAS	-8.81	8.89	NMi-VSL	-4.06	9.53
NMi-VSL	-7.12	4.15	BEV	-7.84	8.54	PTB	-5.63	10.70
CSIRO-NML	-13.03	12.89	SMU	-5.91	13.55			
NPL	-3.89	3.97	NPL	-5.70	13.94			
NRC	1.23	4.95	SP	-6.16	14.55			
NMIJ	-2.74	3.29	VMT/PFI	3.81	14.65			
PTB	1.27	1.50	VNIIM	3.11	14.20			
VNIIM	-2.16	2.40	MIKES	-0.79	11.40			

* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4

** INRIM was named "IMGC" at the time of key comparison CCT-K4

Black: participants in CCT-K4

Green: participants in EUROMET.T-K4

Pair-wise degrees of equivalence inside CCT-K4

Lab *j* →

Lab <i>i</i> ↓	<i>D_i</i> / mK		<i>U_i</i> / mK		BNM-INM		IMGC		KRISS		NIM		NIST		NMI-VSL	
	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK
BNM-INM	-2.69	3.13					-3.54	4.22	-3.44	4.07	0.34	7.00	-3.85	3.36	4.43	5.19
IMGC	0.85	2.58	3.54	4.22					0.10	3.71	3.88	6.80	-0.31	2.60	7.97	5.02
KRISS	0.74	2.69	3.44	4.07	-0.10	3.71					3.78	6.63	-0.41	2.70	7.87	4.89
NIM	-3.03	6.18	-0.34	7.00	-3.88	6.80	-3.78	6.63					-4.19	6.31	4.09	7.51
NIST	1.16	1.01	3.85	3.36	0.31	2.60	0.41	2.70	4.19	6.31					8.28	4.33
NMI-VSL	-7.12	4.15	-4.43	5.19	-7.97	5.02	-7.87	4.89	-4.09	7.51	-8.28	4.33				
CSIRO-NML	-13.03	12.89	-10.35	13.30	-13.89	13.19	-13.79	13.11	-10.01	14.29	-14.20	12.94	-5.92	13.57		
NPL	-3.89	3.97	-1.20	3.77	-4.74	3.53	-4.64	3.34	-0.86	6.61	-5.05	2.43	3.23	4.65		
NRC	1.23	4.95	3.92	5.98	0.39	5.58	0.49	5.63	4.26	8.01	0.07	4.96	8.35	6.57		
NMIJ	-2.74	3.29	-0.05	4.65	-3.59	4.35	-3.49	4.07	0.29	7.01	-3.90	3.52	4.38	5.39		
PTB	1.27	1.50	3.96	3.47	0.42	3.05	0.53	2.83	4.30	6.36	0.11	1.66	8.39	4.41		
VNIIM	-2.16	2.40	0.53	3.94	-3.01	3.71	-2.91	3.53	0.87	6.71	-3.32	2.69	4.96	4.79		

Lab *i* ↓

Lab <i>i</i> ↓	<i>D_i</i> / mK		<i>U_i</i> / mK		CSIRO-NML		NPL		NRC		NMIJ		PTB		VNIIM	
	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK
BNM-INM	-2.69	3.13	10.35	13.30	1.20	3.77	-3.92	5.98	0.05	4.65	-3.96	3.47	-0.53	3.94		
IMGC	0.85	2.58	13.89	13.19	4.74	3.53	-0.39	5.58	3.59	4.35	-0.42	3.05	3.01	3.71		
KRISS	0.74	2.69	13.79	13.11	4.64	3.34	-0.49	5.63	3.49	4.07	-0.53	2.83	2.91	3.53		
NIM	-3.03	6.18	10.01	14.29	0.86	6.61	-4.26	8.01	-0.29	7.01	-4.30	6.36	-0.87	6.71		
NIST	1.16	1.01	14.20	12.94	5.05	2.43	-0.07	4.96	3.90	3.52	-0.11	1.66	3.32	2.69		
NMI-VSL	-7.12	4.15	5.92	13.57	-3.23	4.65	-8.35	6.57	-4.38	5.39	-8.39	4.41	-4.96	4.79		
CSIRO-NML	-13.03	12.89			-9.15	13.20	-14.27	13.86	-10.30	13.30	-14.31	12.97	-10.88	13.14		
NPL	-3.89	3.97	9.15	13.20			-5.12	5.51	-1.15	4.03	-5.16	2.58	-1.73	3.19		
NRC	1.23	4.95	14.27	13.86	5.12	5.51			3.97	6.06	-0.04	5.21	3.39	5.63		
NMIJ	-2.74	3.29	10.30	13.30	1.15	4.03	-3.97	6.06			-4.01	3.62	-0.58	4.19		
PTB	1.27	1.50	14.31	12.97	5.16	2.58	0.04	5.21	4.01	3.62			3.43	2.82		
VNIIM	-2.16	2.40	10.88	13.14	1.73	3.19	-3.39	5.63	0.58	4.19	-3.43	2.82				

Key comparison EUROMET.T-K4 Freezing-point temperature of Ag fixed-point cells
 Pair-wise degrees of equivalence inside EUROMET.T-K4

961.78 °C

Lab <i>i</i>	D_i / mK		U_i / mK		Lab <i>j</i> →																
	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	CMI		GUM		LNE-INM		MIRS		METAS		BEV		SMU		NPL		
CMI	-11.35	8.07																			
GUM	-6.08	7.47	5.27	9.29																	
LNE-INM	2.54	9.44	13.89	10.93	8.62	10.50															
MIRS	-4.71	9.11	6.64	10.65	1.37	10.21	-7.25	11.72													
METAS	-8.81	8.89	2.54	10.47	-2.73	10.02	-11.35	11.56	-4.10	11.29											
BEV	-7.84	8.54	3.51	10.17	-1.76	9.71	-10.38	11.29	-3.13	11.01	0.97	10.84									
SMU	-5.91	13.55	5.44	14.63	0.17	14.32	-8.45	15.43	-1.20	15.23	2.90	15.11	1.93	14.90							
NPL	-5.70	13.94	5.65	15.00	0.38	14.69	-8.24	15.78	-0.99	15.58	3.11	15.46	2.14	15.26	0.21	18.54					
SP	-6.16	14.55	5.19	15.56	-0.08	15.36	-8.70	16.41	-1.45	16.22	2.65	16.00	1.68	15.81	-0.25	18.99	-0.46	19.35			
VMT/PFI	3.81	14.65	15.16	15.66	9.89	14.93	1.27	13.58	8.52	12.98	12.62	11.56	11.65	12.98	9.72	18.72	9.51	15.83			
VNIIM	3.11	14.20	14.46	15.24	9.19	14.93	0.57	16.00	7.82	15.81	11.92	15.69	10.95	15.49	9.02	18.73	8.81	19.02			
MIKES	-0.79	11.40	10.56	12.66	5.29	12.29	-3.33	13.58	3.92	13.35	8.02	13.20	7.05	12.97	5.12	16.70	4.91	17.02			
EIM	2.95	10.96	14.30	12.27	9.03	11.89	0.41	13.21	7.66	12.98	11.76	12.83	10.79	12.59	2.43	16.41	8.65	16.73			
INRIM	-3.98	9.44	7.37	10.93	2.10	10.50	-6.52	11.98	0.73	11.72	4.83	11.56	3.86	11.29	1.93	15.43	1.72	15.78			
IPQ	-1.28	11.41	10.07	12.67	4.80	12.30	-3.82	13.58	3.43	13.36	7.53	13.21	6.56	12.98	4.63	16.71	4.42	17.03			
CEM	-2.69	14.18	8.66	15.22	3.39	14.91	-5.23	15.99	2.02	15.80	6.12	15.67	5.15	15.48	3.22	18.72	3.01	19.00			
NMi-VSL	-4.06	9.53	7.29	11.01	2.02	10.58	-6.60	12.05	0.65	11.79	4.75	11.63	3.78	11.36	1.85	15.49	1.64	15.83			
PTB	-5.63	10.70	5.72	12.04	0.45	11.65	-8.17	13.00	-0.92	12.76	3.18	12.61	2.21	12.36	0.28	16.24	0.07	16.56			

Key comparison EUROMET.T-K4 Freezing-point temperature of Ag fixed-point cells
 Pair-wise degrees of equivalence inside EUROMET.T-K4

961.78 °C

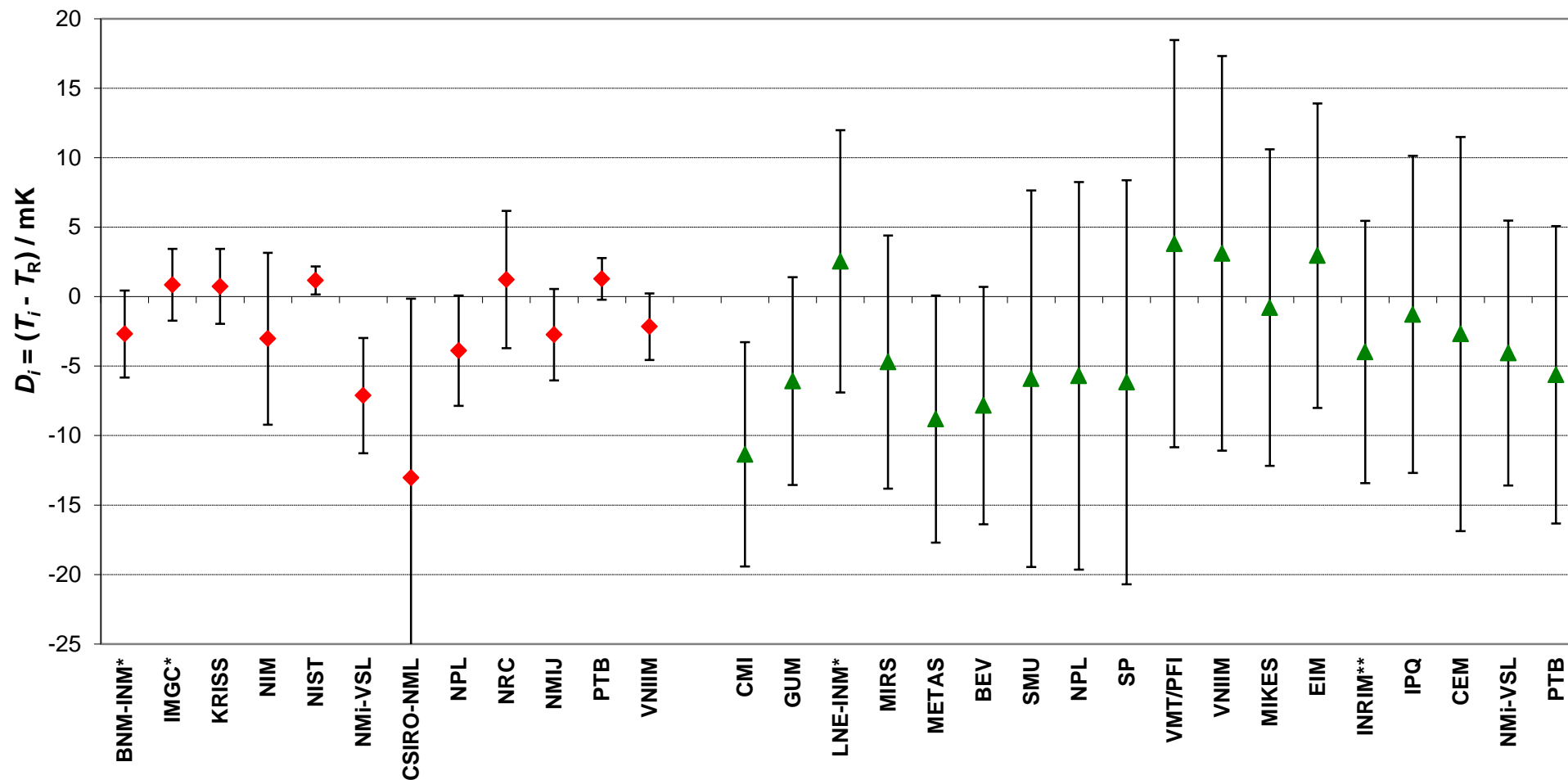
Lab <i>i</i>	D_i / mK		U_i / mK		Lab <i>j</i> →															
	D_{ij} / mK	U_{ij} / mK	D_{ij} / mK	U_{ij} / mK	SP		VMT/PFI		VNIIM		MIKES		EIM		INRIM		IPQ		CEM	
CMI	-11.35	8.07	-5.19	15.56	-15.16	15.66	-14.46	15.24	-10.56	12.66	-14.30	12.27	-7.37	10.93	-10.07	12.67	-8.66	15.22		
GUM	-6.08	7.47	0.08	15.36	-9.89	14.93	-9.19	14.93	-5.29	12.29	-9.03	11.89	-2.10	10.50	-4.80	12.30	-3.39	14.91		
LNE-INM	2.54	9.44	8.70	16.41	-1.27	13.58	-0.57	16.00	3.33	13.58	-0.41	13.21	6.52	11.98	3.82	13.58	5.23	15.99		
MIRS	-4.71	9.11	1.45	16.22	-8.52	12.98	-7.82	15.81	-3.92	13.35	-7.66	12.98	-0.73	11.72	-3.43	13.36	-2.02	15.80		
METAS	-8.81	8.89	-2.65	16.00	-12.62	11.56	-11.92	15.69	-8.02	13.20	-11.76	12.83	-4.83	11.56	-7.53	13.21	-6.12	15.67		
BEV	-7.84	8.54	-1.68	15.81	-11.65	12.98	-10.95	15.49	-7.05	12.97	-10.79	12.59	-3.86	11.29	-6.56	12.98	-5.15	15.48		
SMU	-5.91	13.55	0.25	18.99	-9.72	18.72	-9.02	18.73	-5.12	16.70	-2.43	16.41	-1.93	15.43	-4.63	16.71	-3.22	18.72		
NPL	-5.70	13.94	0.46	19.35	-9.51	15.83	-8.81	19.02	-4.91	17.02	-8.65	16.73	-1.72	15.78	-4.42	17.03	-3.01	19.00		
SP	-6.16	14.55			-9.97	17.07	-9.27	19.46	-5.37	17.52	-9.11	17.24	-2.18	16.31	-4.88	17.52	-3.47	19.45		
VMT/PFI	3.81	14.65	9.97	17.07			0.70	19.54	4.60	27.95	7.29	17.33	7.79	16.41	5.09	17.61	6.50	19.53		
VNIIM	3.11	14.20	9.27	19.46	-0.70	19.54			3.90	17.23	0.16	16.95	7.09	16.00	4.39	17.24	5.80	19.19		
MIKES	-0.79	11.40	5.37	17.52	-4.60	27.95	-3.90	17.23			-3.74	14.68	3.19	13.58	0.49	15.01	1.90	17.22		
EIM	2.95	10.96	9.11	17.24	-7.29	17.33	-0.16	16.95	3.74	14.68			6.93	13.21	4.23	14.68	6.43	16.93		
INRIM	-3.98	9.44	2.18	16.31	-7.79	16.41	-7.09	16.00	-3.19	13.58	-6.93	13.21			-2.70	13.58	-0.50	15.99		
IPQ	-1.28	11.41	4.88	17.52	-5.09	17.61	-4.39	17.24	-0.49	15.01	-4.23	14.68	2.70	13.58			2.20	17.22		
CEM	-2.69	14.18	3.47	19.45	-6.50	19.53	-5.80	19.19	-1.90	17.22	-6.43	16.93	0.50	15.99	-2.20	17.22				
NMi-VSL	-4.06	9.53	2.10	16.36	-7.87	16.46	-7.17	16.06	-3.27	13.64	-7.01	13.28	-0.08	12.05	-2.78	13.65	-1.37	16.04		
PTB	-5.63	10.70	0.53	17.07	-9.44	17.16	-8.74	16.78	-4.84	14.48	-8.58	14.14	-1.65	13.00	-4.35	14.49	-2.94	16.77		

Key comparison EUROMET.T-K4 Freezing-point temperature of Ag fixed-point cells
 Pair-wise degrees of equivalence inside EUROMET.T-K4

961.78 °C

Lab <i>i</i>			Lab <i>j</i> →			
	<i>D_i</i> / mK	<i>U_i</i> / mK	NMI-VSL		PTB	
			<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK	<i>D_{ij}</i> / mK	<i>U_{ij}</i> / mK
CMI	-11.35	8.07	-7.29	11.01	-5.72	12.04
GUM	-6.08	7.47	-2.02	10.58	-0.45	11.65
LNE-INM	2.54	9.44	6.60	12.05	8.17	13.00
MIRS	-4.71	9.11	-0.65	11.79	0.92	12.76
METAS	-8.81	8.89	-4.75	11.63	-3.18	12.61
BEV	-7.84	8.54	-3.78	11.36	-2.21	12.36
SMU	-5.91	13.55	-1.85	15.49	-0.28	16.24
NPL	-5.70	13.94	-1.64	15.83	-0.07	16.56
SP	-6.16	14.55	-2.10	16.36	-0.53	17.07
VMT/PFI	3.81	14.65	7.87	16.46	9.44	17.16
VNIIM	3.11	14.20	7.17	16.06	8.74	16.78
MIKES	-0.79	11.40	3.27	13.64	4.84	14.48
EIM	2.95	10.96	7.01	13.28	8.58	14.14
INRIM	-3.98	9.44	0.08	12.05	1.65	13.00
IPQ	-1.28	11.41	2.78	13.65	4.35	14.49
CEM	-2.69	14.18	1.37	16.04	2.94	16.77
NMI-VSL	-4.06	9.53			1.57	13.06
PTB	-5.63	10.70	-1.57	13.06		

CCT-K4 and EUROMET.T-K4 Freezing-point temperature of Ag fixed-point cells
Nominal temperature: 961.78 °C
Degrees of equivalence: [D_i and U_i (expanded uncertainty at 95% confidence level)]



* LNE-INM was named "BNM-INM" at the time of key comparison CCT-K4
 ** INRIM was named "IMGC" at the time of key comparison CCT-K4

Red diamonds: participants in CCT-K4
Green triangles: participants in EUROMET.T-K4