Key comparisons CCT-K5, CCT-K5.1, APMP.T-K5, COOMET.T-K5 and EUROMET.T-K5

MEASURAND : Temperature
NOMINAL TEMPERATURE : T_{nom} = 1084 °C

Key comparison CCT-K5

Four Tungsten-strip lamps were used as transfer standards for radiance temperature measurements at specific currents corresponding to each nominal temperature T_{nom}. To shorten the measurement time significantly the set of transfer standards was split in two sets of two lamps for simultaneous comparisons in two loops. The pilot of each loop measured both lamp sets in order to establish a linkage mechanism described on page 19 of the CCT-K5 Final Report.

T_i : temperature value measured by laboratory *i*
u_i : standard uncertainty of T_i

Lamp S/N C564

Lab*i*	T_i / °C	u_i / °C
VSL	1086.602	0.11
NMIA	1086.572	0.02
KRISS	1086.562	0.08
NIM	-	-
A*STAR	1086.182	0.16
NMIJ	1086.722	0.13
VNIIM	1086.662	0.19

Lamp S/N C860

Lab*i*	T_i / °C	u_i / °C
NPL	1085.207	0.15
NIST	-	-
CENAM	1085.517	0.26
LNE-INM	1084.917	0.16
INRIM	1085.607	0.09
PTB	1085.497	0.17

Lamp S/N C681

Lab*i*	T_i / °C	u_i / °C
VSL	1086.522	0.11
NMIA	1086.552	0.02
KRISS	1086.642	0.08
NIM	-	-
A*STAR	1085.842	0.16
NMIJ	1086.622	0.13
VNIIM	1086.282	0.19

Lamp S/N C864

Lab*i*	T_i / °C	u_i / °C
NPL	1085.111	0.15
NIST	-	-
CENAM	1085.401	0.26
LNE-INM	1085.191	0.16
INRIM	1085.361	0.09
PTB	1085.221	0.17

Key comparison CCT-K5.1

This is bilateral comparison between the PTB and the NRC.
T_{NRC}: temperature value measured at the NRC
u_{NRC}: standard uncertainty of T_{NRC}

Lamp C598	T_{NRC} = 1084.85 °C u_{NRC} = 0.23 °C	**Lamp 644C**	T_{NRC} = 1084.98 °C u_{NRC} = 0.23 °C

Key comparison APMP.T-K5

Laboratory individual measurements of APMP.T-K5 participants are given in Appendix B of the APMP.T-K5 Final Report both in tabulated and in graphical forms. They were carried out between 1997 and 2000.

Key comparison COOMET.T-K5

This bilateral comparison was carried out between VNIIM and NSC IM.
The measurements were carried out from August to October 2014 using a vacuum tungsten ribbon lamb (S/N SI 10-300 No. 5).

Key comparison EUROMET.T-K5

This comparison involved eight participants and was carried out from October 1999 to February 2001.
The two transfer standards were Lamp S/N C564 and Lamp S/N C681 already used in CCT-K5.
The individual laboratory measurements and their uncertainties are given in Tables 5 to 11 of the EUROMET.T-K5 Final Report.

Key comparisons CCT-K5, CCT-K5.1, APMP.T-K5, COOMET.T-K5 and EUROMET.T-K5

Key comparison CCT-K5

MEASURAND : Temperature
NOMINAL TEMPERATURE : T_{nom} = 1084 °C

The key comparison reference value T_R for each nominal temperature T_{nom} and each lamp k is calculated on the basis of the median of measured radiance temperatures $T_i(k, T_{nom})$. Its standard uncertainty, $u(T_R)$, is obtained as the standard uncertainty of the median.

Lamp	T_R / °C	$u(T_R)$ / °C
C564	1086.670	0.111
C681	1086.480	0.039
C860	1085.440	0.123
C864	1085.280	0.104

For each temperature T_{nom} the degree of equivalence of laboratory i with respect to the key comparison reference value is given by a pair of terms: D_i and its expanded uncertainty U_i (k = 2) both expressed in K. The computation of D_i and U_i is explained in the Addendum to the CCT-K5 Final Report. N.B. Pair-wise degrees of equivalence are no longer issued.

Linking key comparison CCT-K5.1 to CCT-K5

The linkage is made through the common participation of PTB in both key comparisons, and is detailed in the CCT-K5 and CCT-K5.1 Linkage Report.

Linking key comparison APMP.T-K5 to CCT-K5

The linkage is made through the common participation of NMIJ, NIM, KRISS and NMIA in both key comparisons, and is detailed in the Addendum to the APMP.T-K5 Final Report.

Linking key comparison COOMET.T-K5 to CCT-K5

The linkage is made through the common participation of VNIIM in both key comparisons, and is detailed in the COOMET.T-K5 Final Report.

Linking key comparison EUROMET.T-K5 to CCT-K5

The measurements of the EUROMET.T-K5 participants are directly linked to the key comparison reference value obtained in CCT-K5 as the protocols of the two key comparisons are identical and the transfer standards are the same (see in Chapter VII of the EUROMET.T-K5 Final Report).

Degrees of equivalence relative to the CCT-K5 key comparison reference values are computed for each of the transfer standards.
Pair-wise degrees of equivalence inside EUROMET.T-K5 are available in the EUROMET.T-K5 Final Report (Tables 15 to 36).

Key comparisons CCT-K5, CCT-K5.1, APMP.T-K5, COOMET.T-K5 and EUROMET.T-K5

MEASURAND : Temperature
NOMINAL TEMPERATURE : T_{nom} = 1084 °C
Degrees of equivalence relative to the CCT-K5 key comparison reference value

Lab*i*	D_i / K	U_i / K
VSL	-0.013	0.254
NPL	-0.201	0.323
NMIA	-0.013	0.148
KRISS	0.027	0.238
NIM	-	-
A*STAR	-0.563	0.348
NMIJ	0.097	0.288
VNIIM	-0.103	0.408
NIST	-	-
CENAM	0.099	0.532
LNE-INM	-0.306	0.403
INRIM	0.124	0.217
PTB	-0.001	0.213
NRC	-0.036	0.632
KIM-LIPI	0.42	1.84
NSC IM	-0.265	0.654

Lamp S/N C564

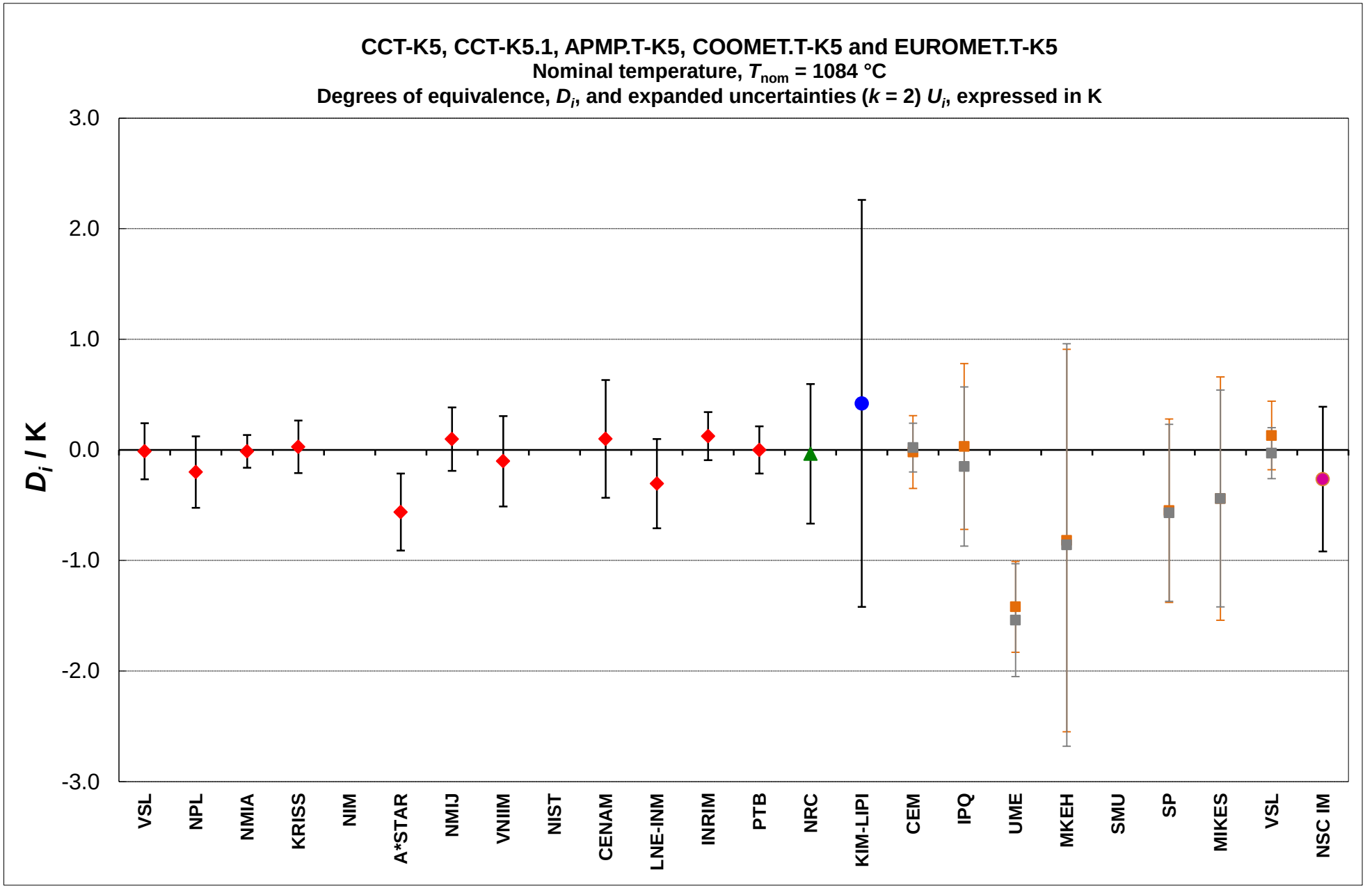
	D_i / K	U_i / K
CEM	-0.02	0.33
IPQ	0.03	0.75
UME	-1.42	0.41
MKEH	-0.82	1.73
SMU	-	-
SP	-0.55	0.83
MIKES	-0.44	1.10
VSL	0.13	0.31

Lamp S/N C681

	D_i / K	U_i / K
CEM	0.02	0.22
IPQ	-0.15	0.72
UME	-1.54	0.51
MKEH	-0.86	1.82
SMU	-	-
SP	-0.57	0.80
MIKES	-0.44	0.98
VSL	-0.03	0.23

Black: participants in CCT-K5
Green: participant in CCT-K5.1
Blue: participant in APMP.T-K5
Purple: participant in COOMET.T-K5
Orange: participants in EUROMET.T-K5 (measurements with Lamp S/N C564)
Grey: participants in EUROMET.T-K5 (measurements with Lamp S/N C681)

N.B. Pair-wise degrees of equivalence are no longer issued.



Red diamonds: participants in CCT-K5
Green triangle: participant in CCT-K5.1
Blue circle: participant in APMP.T-K5
Orange squares: participants in EUROMET.T-K5 (measurements with Lamp S/N C564)
Grey squares: participants in EUROMET.T-K5 (measurements with Lamp S/N C681)
Purple circle: participant in COOMET.T-K5