

Key comparison CCM.G-K2, EURAMET.M.G-K2 and SIM.M.G-K1

Key comparison CCM.G-K2

MEASURAND : Free-fall acceleration

NOMINAL VALUE : 9.81 m/s²

AG(k): absolute gravimeter of Laboratory *k*

Station *j*: designation of the station where the measurement was carried out

***g_{jk}*:** gravity value at Station *j* and height *H_{jk}* after subtraction of 980 960 000 μGal

***u_{jk}*:** combined standard uncertainty declared by laboratory *k*

The comparison was performed in 2013

In general each participant communicated gravity measurements for three of the fifteen stations used

Laboratory individual measurements for CCM.G-K2:

Lab <i>k</i>	AG(<i>k</i>)	Station <i>j</i>	<i>u_{jk}</i> / μGal	<i>g_{jk}</i> / μGal	<i>H_{jk}</i> / cm
LNE-SYRTE	CAG-01	B3	5.2	4206.4	83.30
		A4	5.2	4316.0	83.20
		A2	5.3	4346.5	83.25
NMIJ	FG5-213	C1	2.5	3974.3	120.50
		A2	2.5	4238.3	120.60
		B5	2.5	4067.3	120.55
VUGTK/RIGTC	FG5-215	B2	2.3	4090.8	122.08
		C1	2.3	3972.2	122.16
		A3	2.3	4228.6	122.00
CMS	FG5-231	A4	2.1	4188.9	130.00
		A5	2.1	4180.2	130.00
		B1	2.1	4073.7	130.00
BEV	FG5-242	B1	2.6	4076.5	130.00

Key comparison CCM.G-K2, EURAMET.M.G-K2 and SIM.M.G-K1

Laboratory individual measurements for CCM.G-K2 (continued):

Lab <i>k</i>	AG(<i>k</i>)	Station <i>j</i>	u_{jk} / μGal	g_{jk} / μGal	H_{jk} / cm
KRISS	FG5X-104	B4	2.0	4061.1	130.00
		C3	2.0	3946.5	130.00
		A5	2.0	4182.9	130.00
METAS	FG5X-209	A3	2.1	4204.2	130.00
		B3	2.1	4066.2	130.00
		C3	2.1	3946.2	130.00
FGI	FG5X-221	A2	2.3	4226.6	126.40
		B2	2.3	4082.1	126.30
		C2	2.3	3958.7	126.20
INRIM	IMGC-02	B5	5.2	4256.1	47.09
		C2	5.2	4168.3	48.22
		C3	5.2	4171.3	48.05
NIM	NIM-3A	A3	5.1	4273.9	103.80
		C2	4.8	4017.7	103.80
		B5	5.1	4120.6	103.80

EURAMET.M.G-K2

Raw measurements from Absolute Gravimeters reported by the participants in EURAMET.M.G-K2 are given in Table 4 on page 8 of the Final Report.

The comparison was performed in 2015.

SIM.M.G-K1

Raw measurements from Absolute Gravimeters reported by the participants in SIM.M.G-K1 are given in Table 5 on pp. 7-8 Final Report.

The comparison was performed in 2016.

Key comparison CCM.G-K2, EURAMET.M.G-K2 and SIM.M.G-K1

MEASURAND : Free-fall acceleration

NOMINAL VALUE : 9.81 m/s²

A weighted least-square adjustment is applied to the set of measurements by absolute gravimeters $AG(k)$ at Stations j , g_{jk} , with standard uncertainty u_{jk} , in order to evaluate the gravity value G_j at each Station j , as well as the offset D_k for absolute gravimeter $AG(k)$, as explained in Section 6.2 "Second and final solution" of the Final Report.

G_j is the key comparison reference value for Station j . Its associated expanded uncertainty (at a 95 % level of confidence) is denoted U_j .

G_j values are given after subtraction of 980 960 000 μGal .

The key comparison reference values are defined at the reference height of 1.30 m.

The degree of equivalence of absolute gravimeter $AG(k)$ is given by a pair of terms: D_k and U_k , its expanded uncertainty at a 95 % level of confidence, both expressed in μGal .

Station j	G_j / μGal	U_j / μGal
A1	4228.4	3.9
A2	4216.5	3.3
A3	4206.3	2.9
A4	4189.7	2.6
A5	4183.1	3.2
B1	4076.7	3.4
B2	4072.0	2.8
B3	4068.4	3.2
B4	4062.6	3.5
B5	4049.2	3.0
C1	3951.9	2.9
C2	3945.0	3.7
C3	3948.0	2.8
C4	3946.1	3.6
C5	3942.5	3.3

Linking EURAMET.M.G-K2 to CCM.G-K2

The linkage of EURAMET.M.G-K2 comparison results to CCM.G-K2 comparison results are made by means of four laboratory absolute gravimeters that have been used in both comparisons, and linking process is described in the EURAMET.M.G-K2 Final Report.

Linking SIM.M.G-K1 to CCM.G-K2

SIM.M.G-K1 was linked to CCM.G-K2 using the FG5X-216 gravimeter through EURAMET.M.G-K2.

CCM.G-K2 and EURAMET.M.G-K2

MEASURAND : Free-fall acceleration

NOMINAL VALUE : 9.81 m/s²

Degrees of equivalence of absolute gravimeter AG(k), D_k and U_k (95 % level of confidence), expressed in μGa

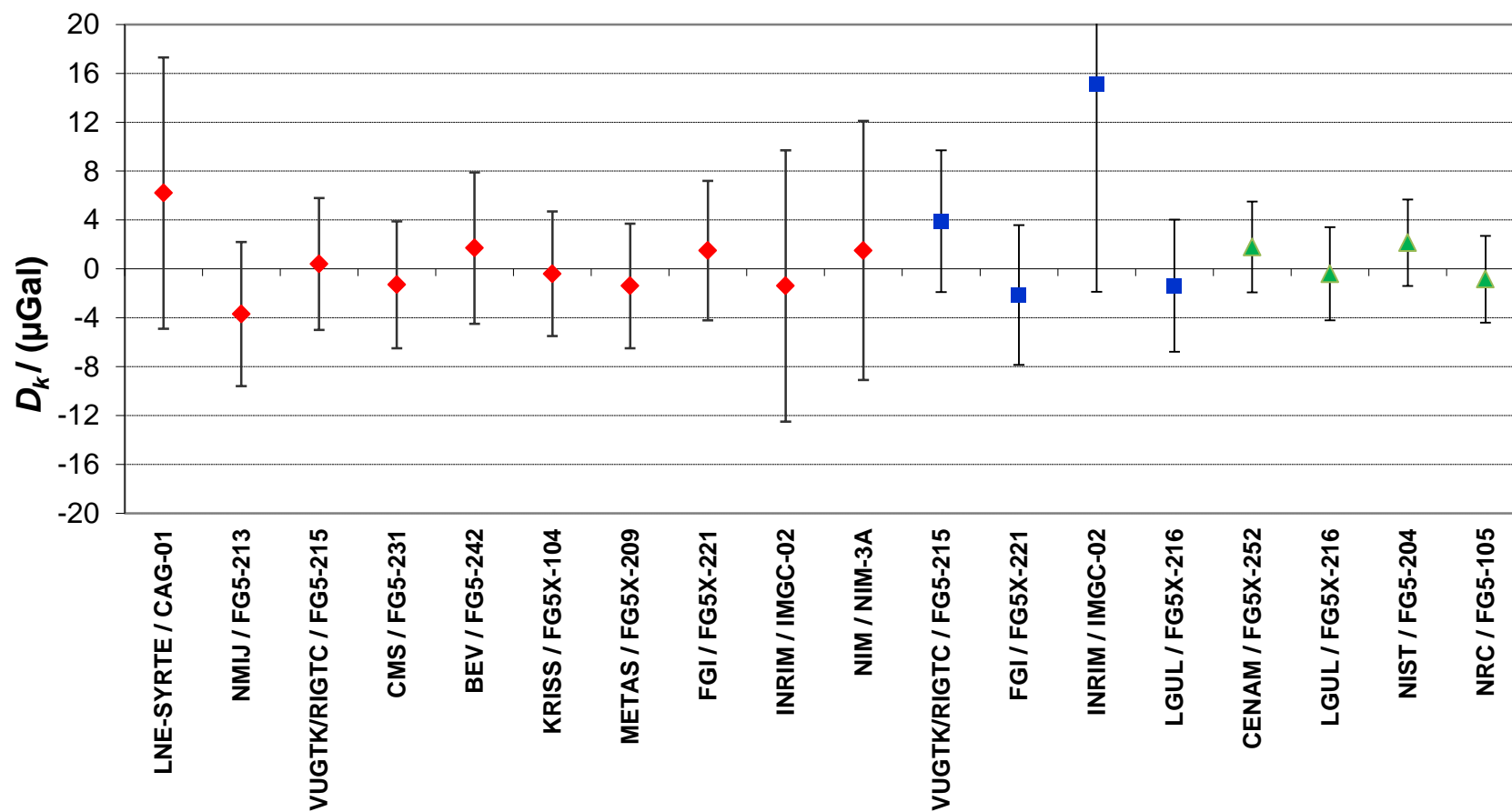
Lab k / AG(k) ↓	D_k / μGal	U_k / μGal
LNE-SYRTE / CAG-01	6.2	11.1
NMIJ / FG5-213	-3.7	5.9
VUGTK/RIGTC / FG5-215	0.4	5.4
CMS / FG5-231	-1.3	5.2
BEV / FG5-242	1.7	6.2
KRISS / FG5X-104	-0.4	5.1
METAS / FG5X-209	-1.4	5.1
FGI / FG5X-221	1.5	5.7
INRIM / IMGC-02	-1.4	11.1
NIM / NIM-3A	1.5	10.6
VUGTK/RIGTC / FG5-215	3.89	5.80
FGI / FG5X-221	-2.14	5.72
INRIM / IMGC-02	15.11	16.98
LGUL / FG5X-216	-1.38	5.40
CENAM / FG5X-252	1.79	3.71
LGUL / FG5X-216	-0.40	3.82
NIST / FG5-204	2.14	3.54
NRC / FG5-105	-0.85	3.55

In red participants in SIM.M.G-K1

In blue participants in EURAMET.M.G-K2

In green participants in SIM.M.G-K1

CCM.G-K2, EURAMET.M.G-K2 and SIM.M.G-K1 Free-fall acceleration



Red diamonds: CCM.G-K2 Blue squares: EURAMET.M.G-K2 Green triangles: SIM.M.G-K1