MEASURAND : **AC Voltage ratio**

NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1;**
Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11

FREQUENCY : **1 kHz**

The measurements of this key comparison were made of twenty AC voltage ratios at two possible frequencies: 1 kHz and 55 Hz. The in-phase and quadrature components of each voltage ratio were reported separately giving a total of 80 possible measurement results for each participant. The 1 kHz measurements were compulsory and all the 17 participating laboratories made these measurements. The 55 Hz measurements were optional, with 7 laboratories contributing.

The measurement results reported by the laboratories participating in CCEM-K7 can be found in section 4 on page 188 of the Final Report, Part 2.

Lab *i*	**Year of measurement**
NMIJ	2000
CEM	2003
NMIA	2001
INRIM	2002
KRISS	2002
LNE	2002
METAS	2000
NIM	2001
NIST	2003
NPL	2003
NPLI	2001
NRC	2003
PTB	2000
SP	2001
UME	2002
VNIIM	2002
VSL	1999

MEASURAND : **AC Voltage ratio**
NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1;**
Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11
FREQUENCY : **1 kHz**

For the in phase and the quadrature components of each voltage ratio, the key comparison reference value, x_R, is calculated as the weighted mean of the particapants' results after exclusion of outliers. Its expanded uncertainty (k = 2), U_R, is calculated as explained in section 1.3 of the Final Report, Part 2.

	In phase		Quadrature	
Nominal ratio	x_R / (nV/V)	U_R / (nV/V)	x_R / (nV/V)	U_R / (nV/V)
0.9	58.3	5.1	-71.6	3.9
0.8	71.5	5.3	-110.2	4.1
0.7	64.0	5.8	-137.0	4.5
0.6	39.0	5.7	-132.5	4.4
0.5	9.8	5.4	-130.3	4.5
0.4	-22.9	5.4	-97.0	4.4
0.3	-38.6	5.1	-51.0	4.3
0.2	-45.9	5.1	-15.4	4.1
0.1	-43.6	4.8	8.9	3.5
0.01	-1160.5	8.4	422.5	5.0
10/11	53.2	5.1	-123.5	3.9
9/11	21.8	5.2	-176.9	4.1
8/11	9.4	5.3	-200.9	4.0
7/11	-6.2	5.3	-186.6	4.5
6/11	-17.1	5.3	-156.5	4.3
5/11	-2.2	5.4	-124.9	4.6
4/11	-31.1	5.4	-46.8	4.3
3/11	-24.5	5.3	-1.6	4.1
2/11	-46.2	5.1	48.9	4.1
1/11	-49.7	5.0	59.6	3.7

For the in phase and the quadrature components of each voltage ratio, the degree of equivalence of each laboratory with respect to the key comparison reference value is given by a pair of terms:
D_i and U_i, its expanded uncertainty (k = 2), both expressed in nV/V.

The degree of equivalence between two laboratories is given by a pair of terms: D_{ij} and U_{ij}, its expanded uncertainty (k = 2), both expressed in nV/V, and can be found in section 3 of the Final Report, Part 2.

MEASURAND : **AC Voltage ratio**
NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1; Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11**
FREQUENCY : **1 kHz**

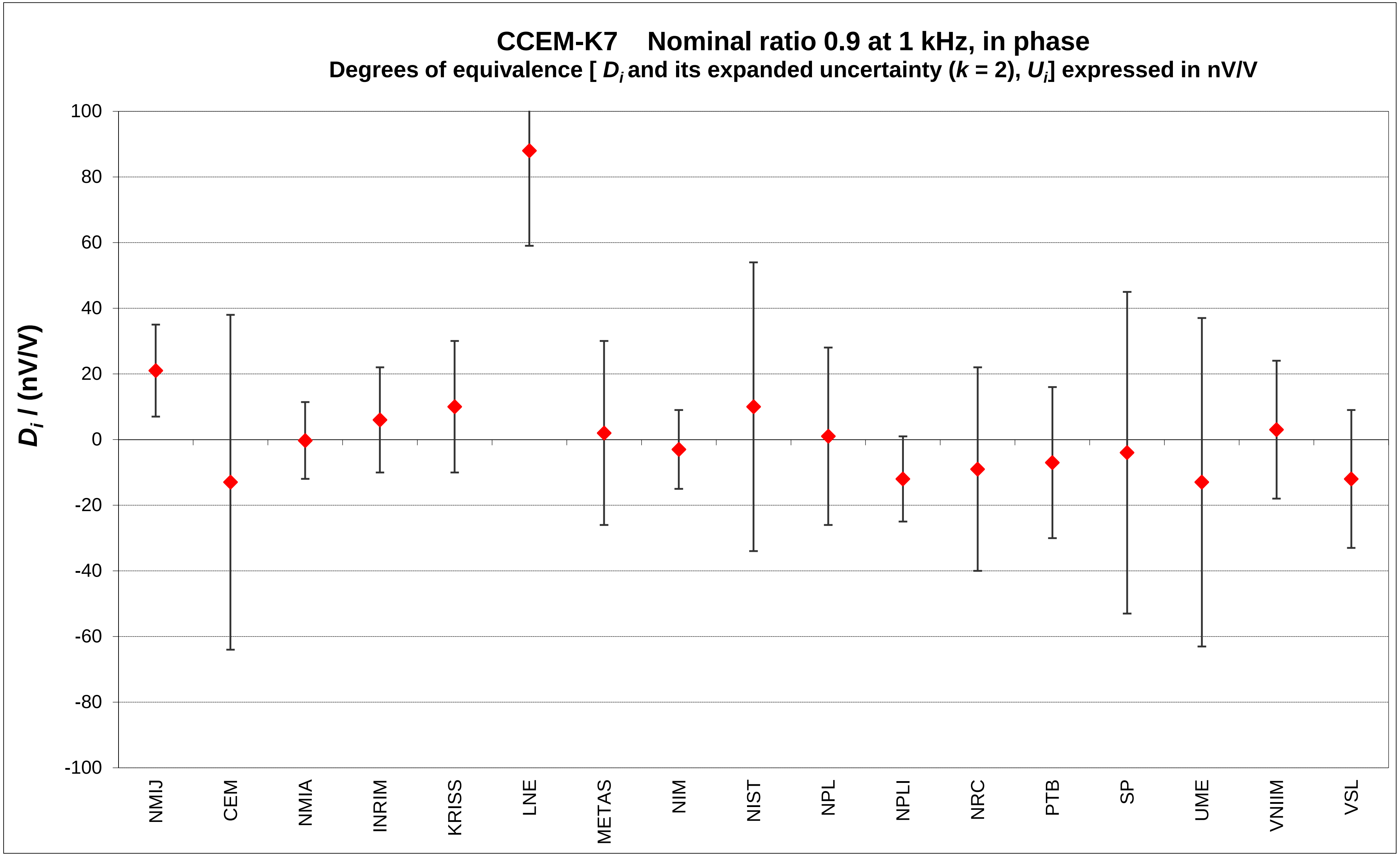
Table of Degrees of equivalence

Voltage ratio	0.9				0.8				0.7				0.6				0.5			
	In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature	
Lab *i*	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i
NMIJ	**21**	14	**-3**	31	**21**	14	**-8**	29	**22**	15	**-11**	27	**16**	13	**-13**	24	**7**	13	**-13**	21
CEM	**-13**	51	**4**	48	**-27**	51	**6**	48	**-31**	51	**8**	48	**-35**	51	**10**	48	**-35**	51	**13**	48
NMIA	**-0.3**	11.7	**2.6**	3.5	**-4.5**	11.7	**3.2**	3.2	**-1.0**	11.4	**4.0**	2.5	**0.0**	11.5	**1.5**	2.7	**2.2**	11.6	**0.3**	2.6
INRIM	**6**	16	**7**	10	**4**	18	**6**	10	**-2**	17	**25**	13	**-6**	16	**11**	14	**-6**	14	**10**	14
KRISS	**10**	20	**-1**	24	**8**	20	**-3**	24	**10**	20	**-4**	24	**7**	20	**-7**	24	**3**	20	**-6**	24
LNE	**88**	29	**-8316**	26	**136**	31	**-12067**	29	**168**	35	**-11028**	33	**179**	37	**-7593**	35	**75**	38	**-3293**	36
METAS	**2**	28	**4**	68	**-4**	35	**7**	108	**-2**	35	**10**	128	**-5**	33	**10**	129	**-7**	30	**12**	123
NIM	**-3**	12	**-6**	9	**-9**	14	**-12**	16	**-4**	14	**-19**	20	**4**	14	**-22**	20	**0**	12	**-28**	16
NIST	**10**	44	**3**	100	**11**	43	**6**	100	**15**	44	**7**	100	**15**	44	**7**	120	**6**	45	**4**	110
NPL	**1**	27	**-12**	25	**-4**	27	**-19**	25	**-2**	27	**-25**	25	**-2**	27	**-30**	25	**0**	27	**-30**	25
NPLI	**-12**	13	**-3098**	300	**6**	13	**-6210**	300	**23**	12	**-7753**	300	**30**	12	**-8728**	300	**33**	13	**-9080**	300
NRC	**-9**	31	**-23**	29	**-21**	31	**-41**	29	**-22**	31	**-51**	29	**-24**	31	**-57**	29	**-23**	31	**-56**	29
PTB	**-7**	23	**-11**	20	**-17**	23	**-19**	20	**-17**	23	**-26**	20	**-19**	23	**-31**	20	**-18**	23	**-31**	20
SP	**-4**	49	**5**	71	**-7**	49	**-5**	71	**-17**	49	**-8**	71	**-15**	49	**-1**	71	**1**	49	**10**	71
UME	**-13**	50	**-14**	59	**-22**	50	**-20**	59	**-19**	50	**-23**	59	**-14**	50	**-22**	59	**-11**	50	**-22**	59
VNIIM	**3**	21	**6**	28	**-1**	21	**11**	28	**1**	21	**15**	28	**0**	21	**18**	28	**-2**	21	**20**	28
VSL	**-12**	21	**-128**	110	**-17**	27	**-240**	150	**-12**	32	**-333**	180	**-10**	37	**-388**	210	**-8**	43	**-390**	230

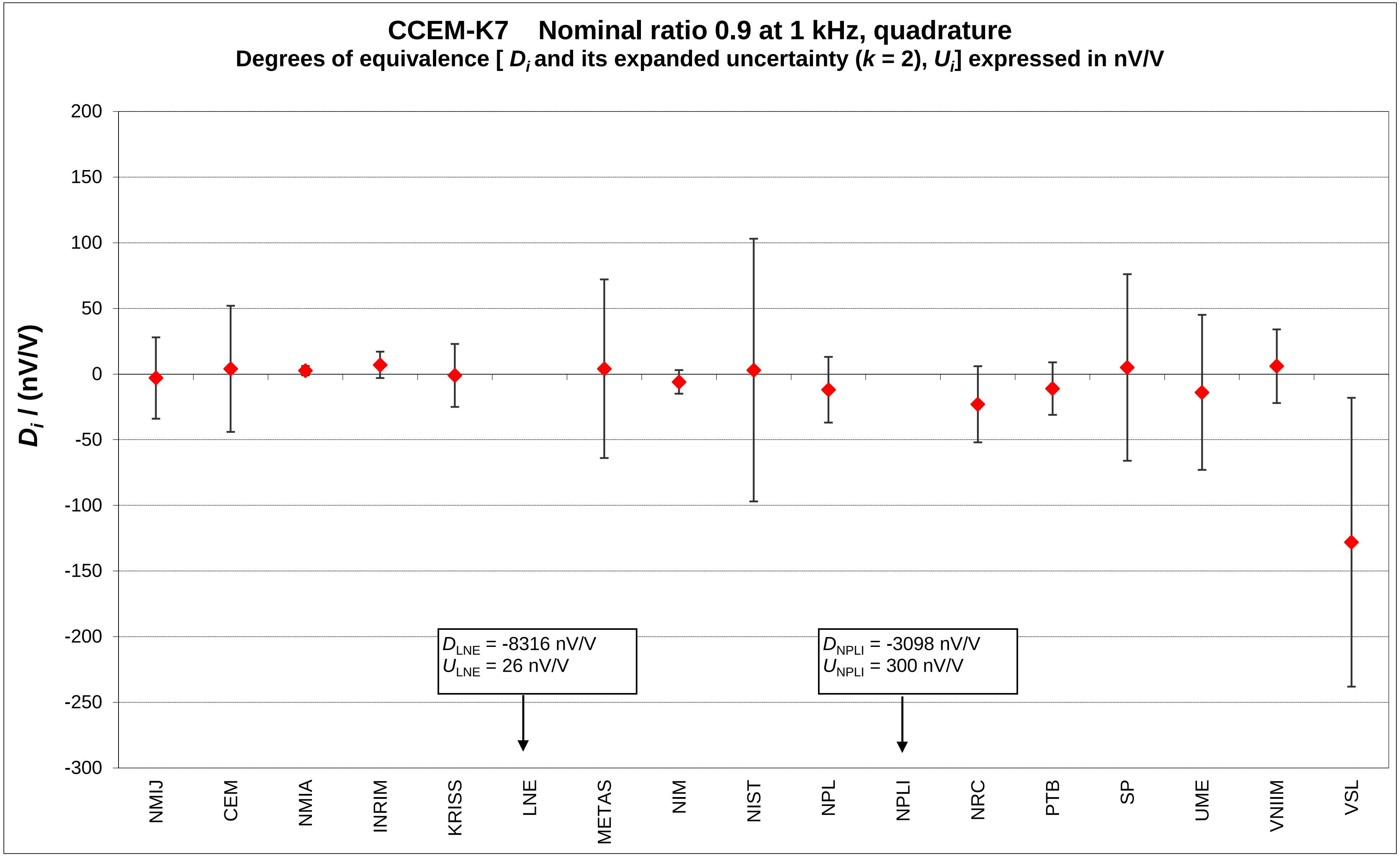
MEASURAND : **AC Voltage ratio**
NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1; Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11**
FREQUENCY : **1 kHz**

Table of Degrees of equivalence

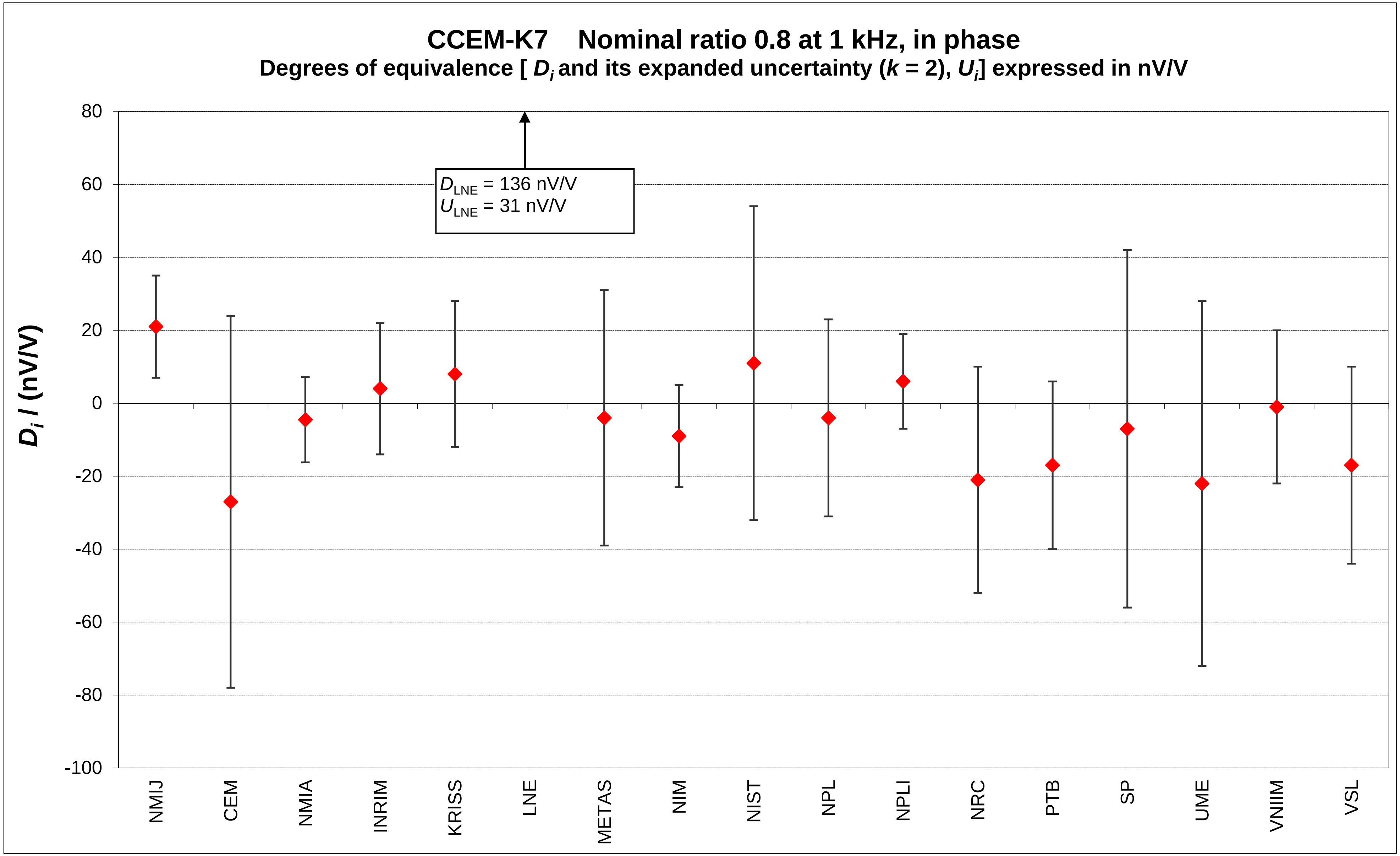
Voltage ratio	0.4				0.3				0.2				0.1				0.01			
	In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature	
Lab i ⇩	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)	D_i	U_i / (nV/V)
NMIJ	**1**	12	**-9**	19	**-7**	12	**-7**	16	**-7**	12	**-4**	13	**-7**	12	**3**	9	**-76**	79	**65**	160
CEM	**-32**	51	**18**	48	**-30**	51	**20**	48	**-20**	51	**19**	48	**-12**	51	**16**	48	**-12**	49	**-9**	50
NMIA	**3.9**	11.6	**2.0**	2.8	**0.6**	11.7	**0.0**	2.9	**0.9**	11.7	**0.4**	3.2	**-0.4**	11.9	**3.1**	3.9	**2.5**	9.7	**0.5**	1.5
INRIM	**-1**	13	**4**	15	**-6**	14	**15**	12	**-3**	14	**10**	11	**7**	14	**-10**	8	**-78**	80	**150**	51
KRISS	**2**	20	**-4**	24	**-2**	20	**-6**	24	**-1**	20	**-6**	24	**-2**	20	**-1**	24	**-38**	22	**20**	30
LNE	**-58**	37	**2176**	35	**-135**	35	**7460**	33	**-91**	31	**9880**	29	**11**	29	**7879**	26	**2428**	15	**527**	11
METAS	**-5**	29	**15**	129	**-9**	27	**14**	128	**-6**	24	**12**	108	**-5**	19	**11**	68	**-78**	65	**68**	85
NIM	**16**	14	**-26**	12	**12**	14	**-29**	9	**3**	17	**-20**	9	**1**	13	**-1**	9	**8**	13	**-60**	8
NIST	**12**	45	**12**	110	**6**	46	**12**	110	**5**	45	**12**	100	**3**	44	**14**	100	**-57**	500	**71**	500
NPL	**3**	27	**-26**	25	**-1**	27	**-22**	25	**1**	27	**-15**	25	**0**	27	**-5**	25	**33**	50	**-11**	49
NPLI	**32**	13	**-8333**	300	**21**	13	**-6989**	300	**18**	13	**-5315**	300	**10**	13	**-2599**	300	**-54**	11	**3488**	300
NRC	**-21**	31	**-48**	29	**-21**	31	**-40**	29	**-15**	31	**-27**	29	**-9**	31	**-10**	29	**2329**	61	**-861**	60
PTB	**-13**	23	**-25**	20	**-13**	23	**-22**	20	**-8**	23	**-14**	20	**-6**	23	**-4**	20	**-1**	51	**-49**	100
SP	**10**	49	**11**	71	**2**	49	**17**	71	**1**	49	**6**	71	**-3**	49	**9**	71	**-18**	49	**-38**	71
UME	**-3**	50	**-12**	59	**-4**	50	**-11**	59	**2**	50	**-1**	59	**1**	50	**4**	59	**14**	88	**-1094**	88
VNIIM	**-1**	21	**23**	28	**-7**	21	**18**	28	**-5**	21	**21**	28	**-4**	22	**11**	28	**-4**	24	**-36**	33
VSL	**-2**	37	**-343**	210	**-2**	32	**-259**	180	**2**	27	**-165**	150	**2**	21	**-79**	110	**-86**	43	**-2**	260

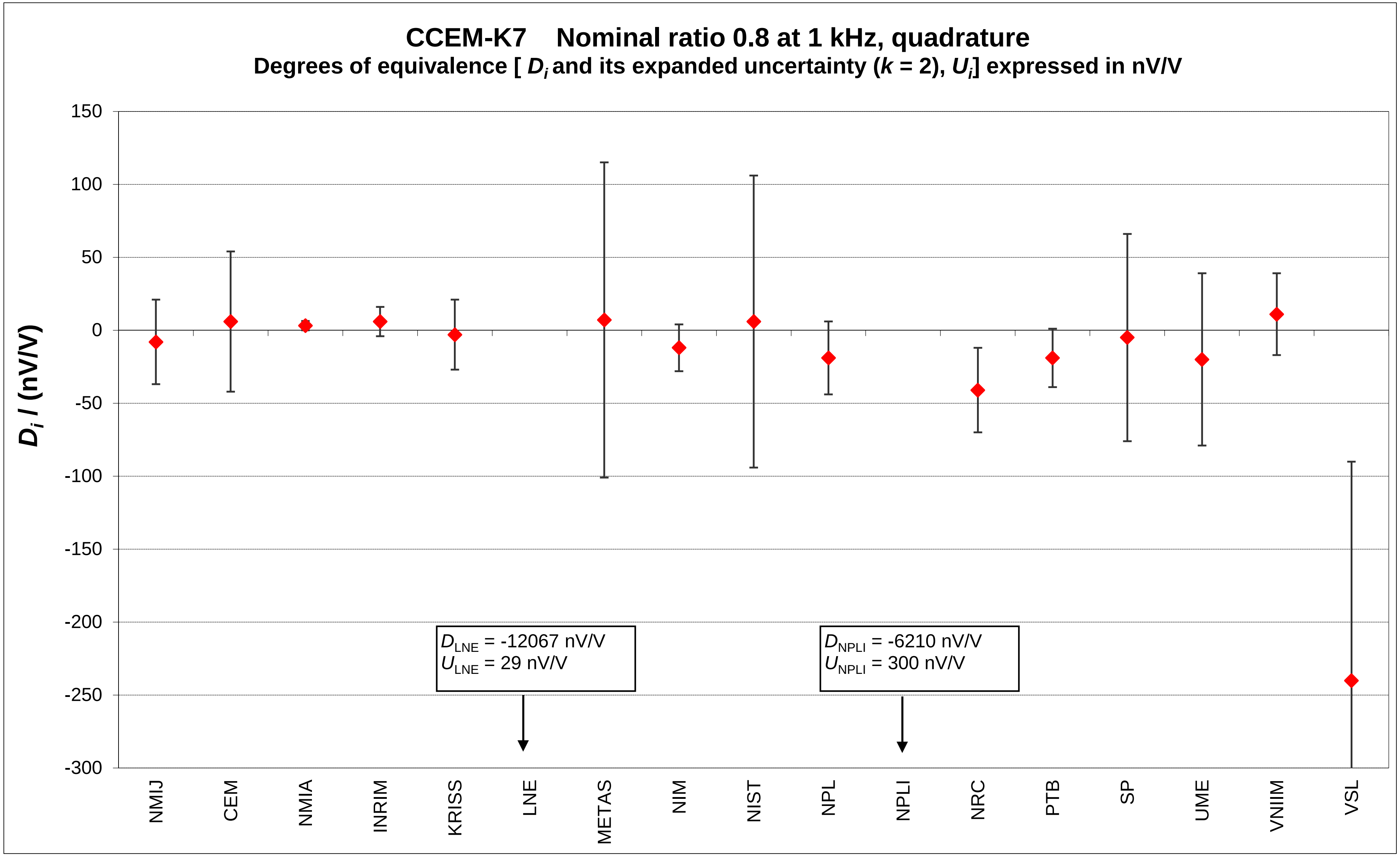


CCEM-K7 Nominal ratio 0.9 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
100
80
60
40
20
0
-20
-40
-60
-80
-100
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

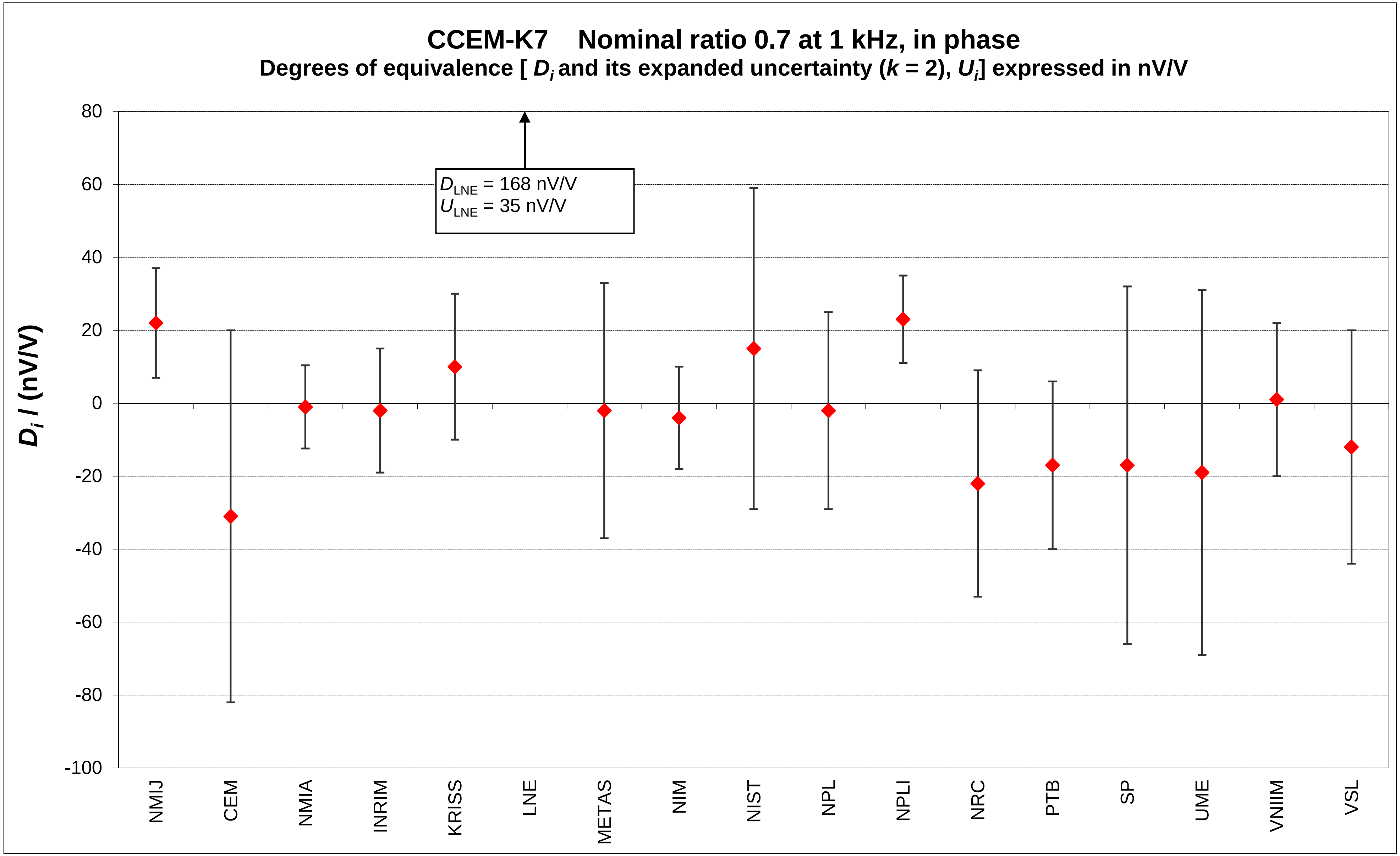


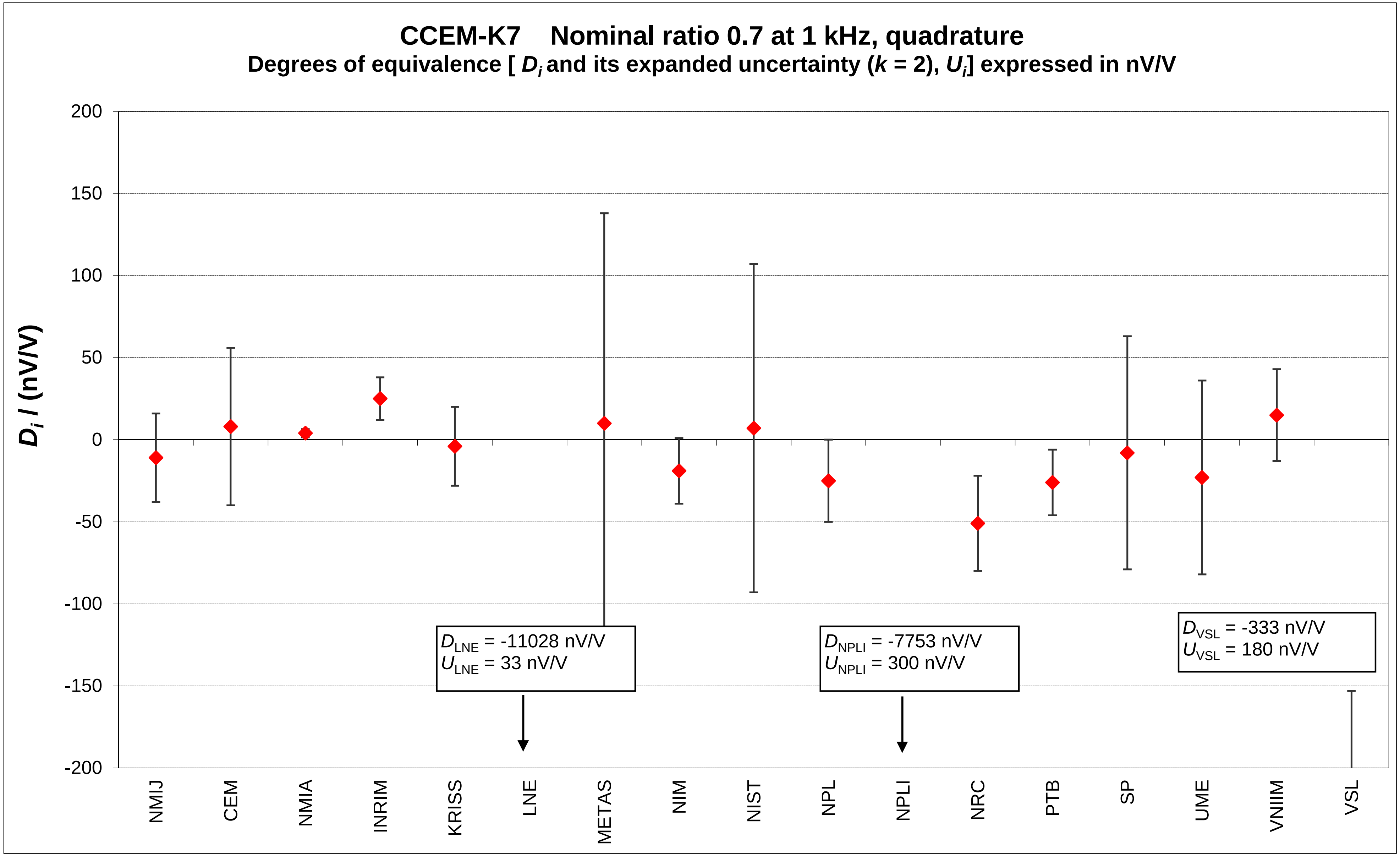
CCEM-K7 Nominal ratio 0.9 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
-250
-300
D_{LNE} = -8316 nV/V
U_{LNE} = 26 nV/V
D_{NPLI} = -3098 nV/V
U_{NPLI} = 300 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

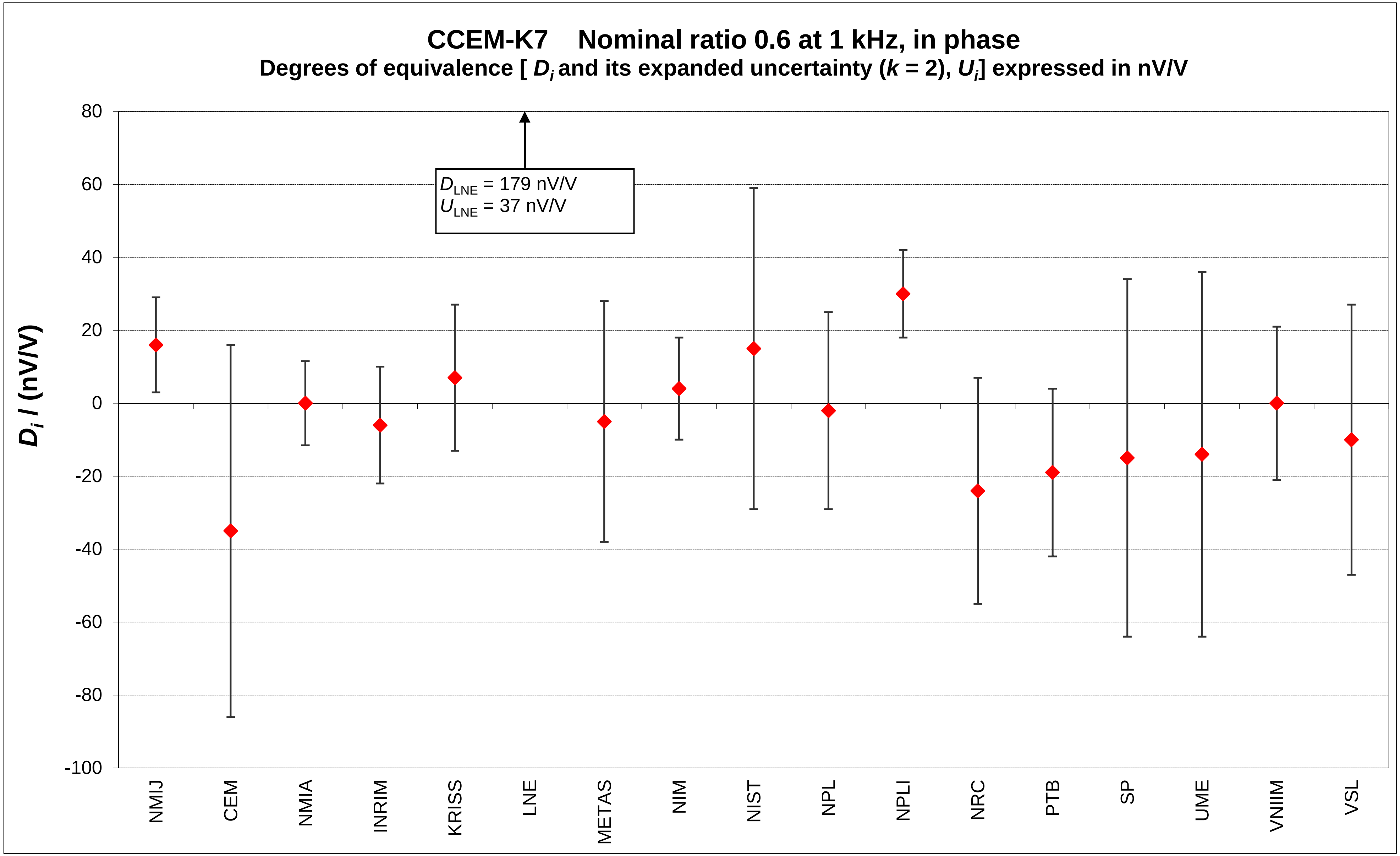

CCEM-K7 Nominal ratio 0.8 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_{LNE} = 136 nV/V
U_{LNE} = 31 nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

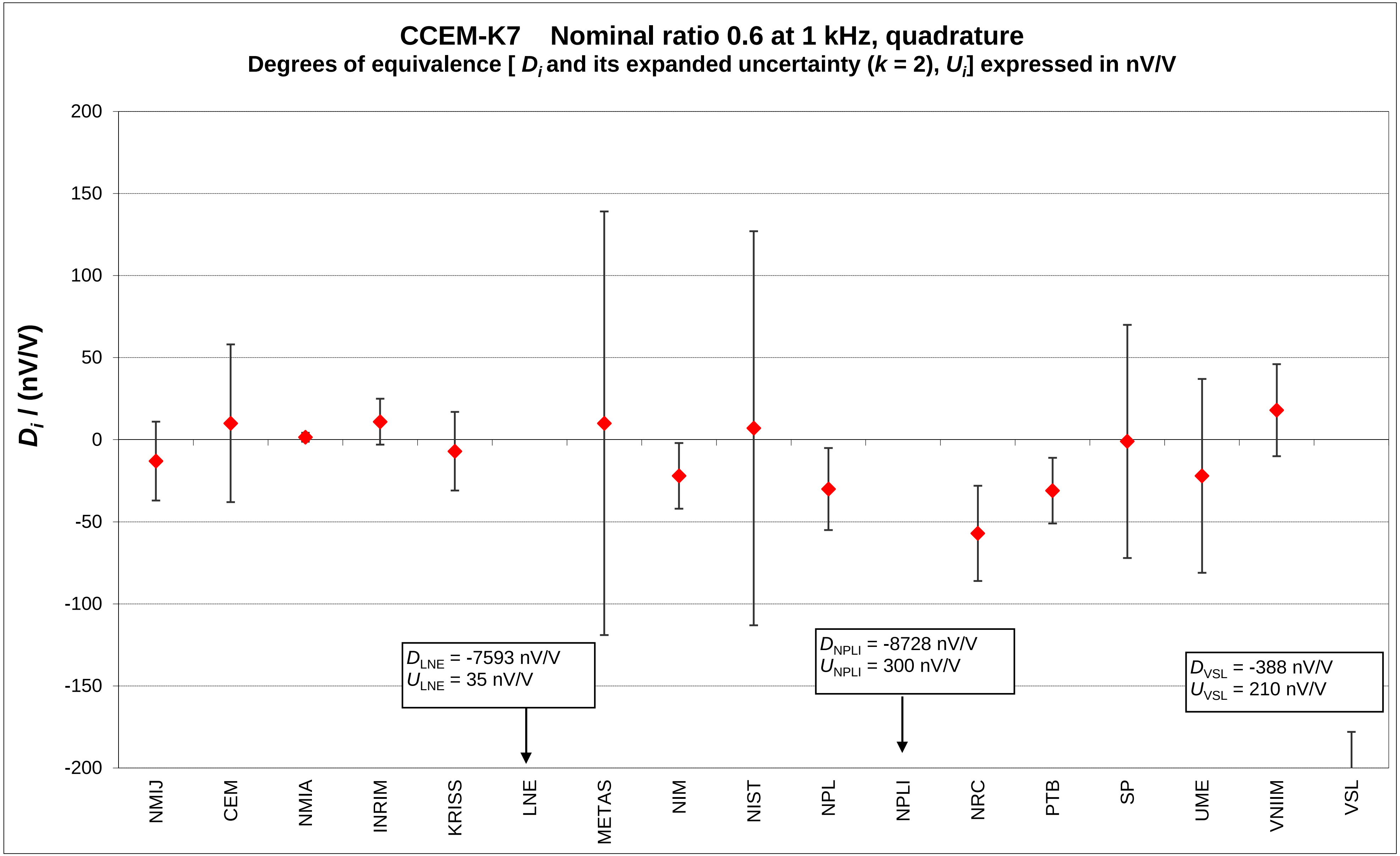


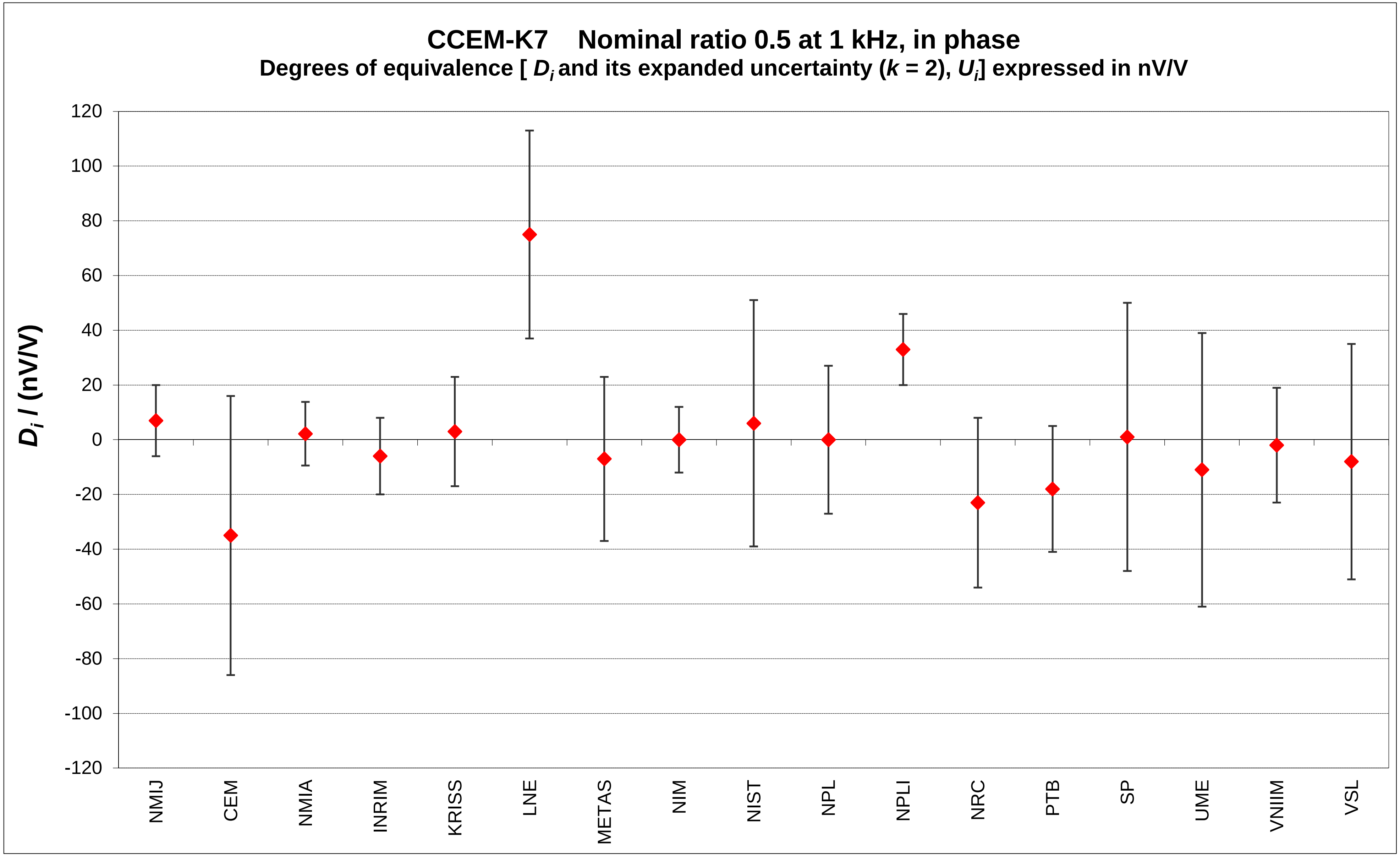
CCEM-K7 Nominal ratio 0.8 at 1 kHz, quadrature
Degrees of equivalence [Di and its expanded uncertainty (k = 2), Ui] expressed in nV/V
Di / (nV/V)
150
100
50
0
-50
-100
-150
-200
-250
-300
DLNE = -12067 nV/V
ULNE = 29 nV/V
DNPLI = -6210 nV/V
UNPLI = 300 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.7 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_{LNE} = 168 nV/V
U_{LNE} = 35 nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.7 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -11028 nV/V
U_{LNE} = 33 nV/V
D_{NPLI} = -7753 nV/V
U_{NPLI} = 300 nV/V
D_{VSL} = -333 nV/V
U_{VSL} = 180 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.6 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
D_{LNE} = 179 nV/V
U_{LNE} = 37 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.6 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -7593 nV/V
U_{LNE} = 35 nV/V
D_{NPLI} = -8728 nV/V
U_{NPLI} = 300 nV/V
D_{VSL} = -388 nV/V
U_{VSL} = 210 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



CCEM-K7 Nominal ratio 0.5 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
-120
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
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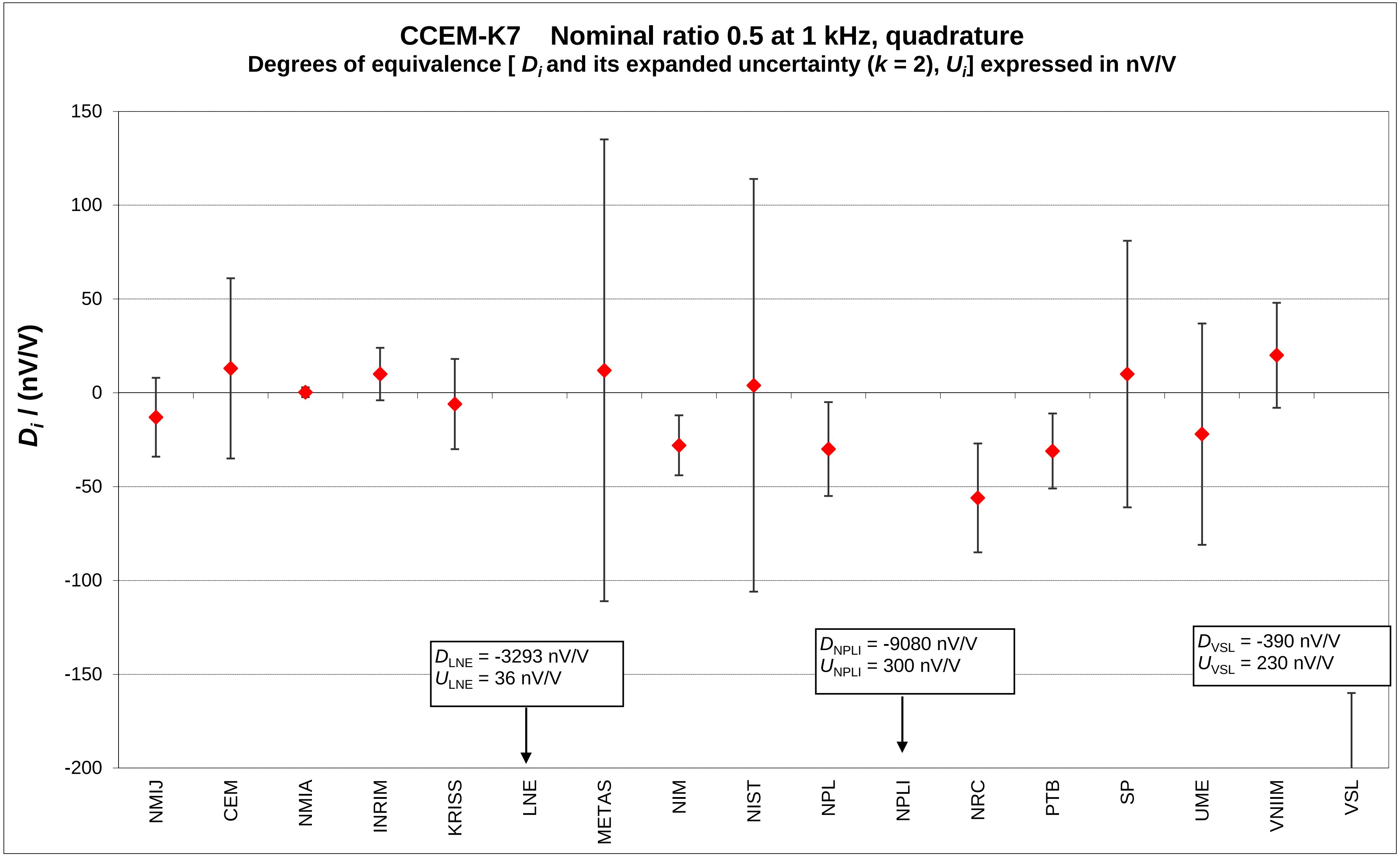
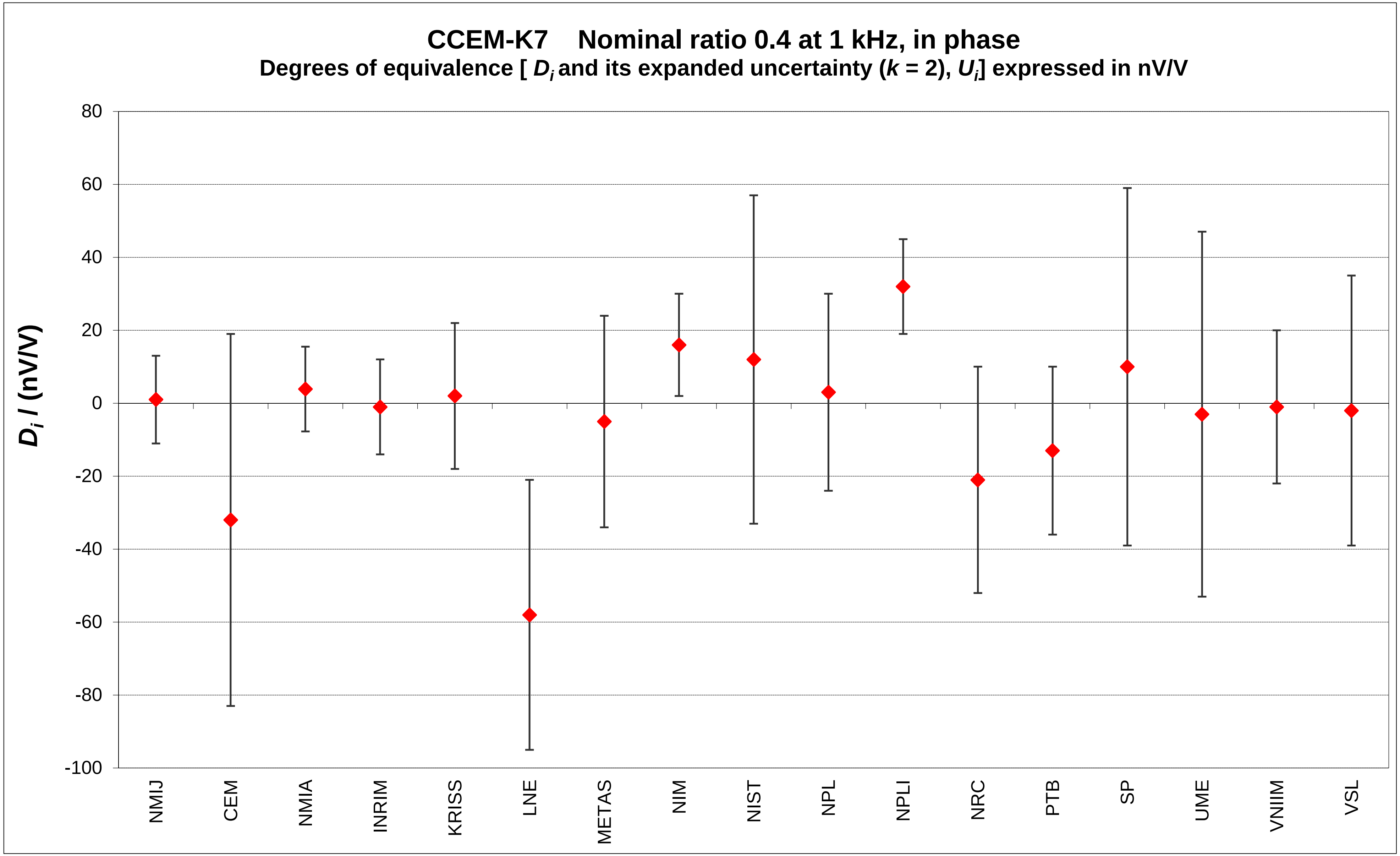
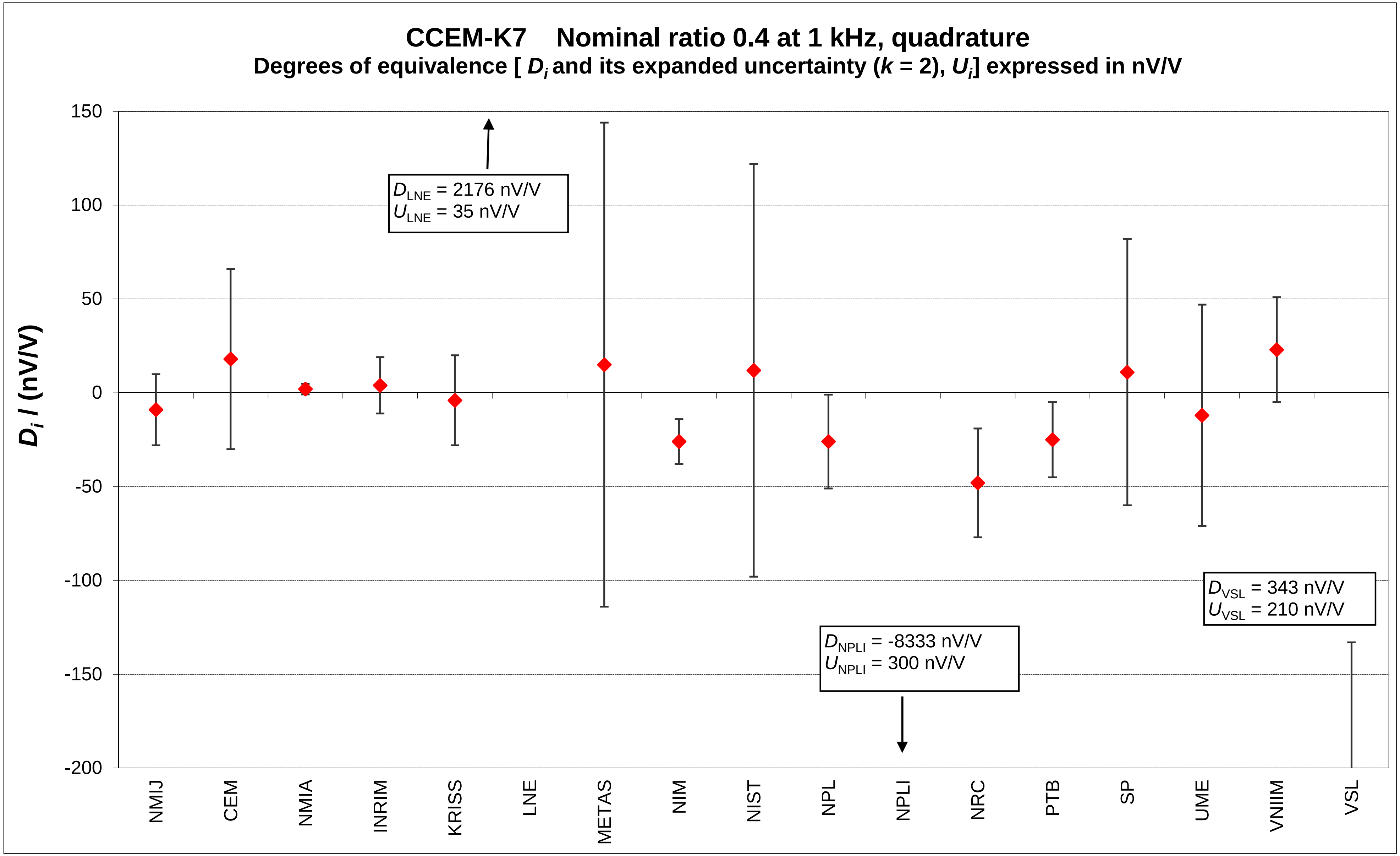
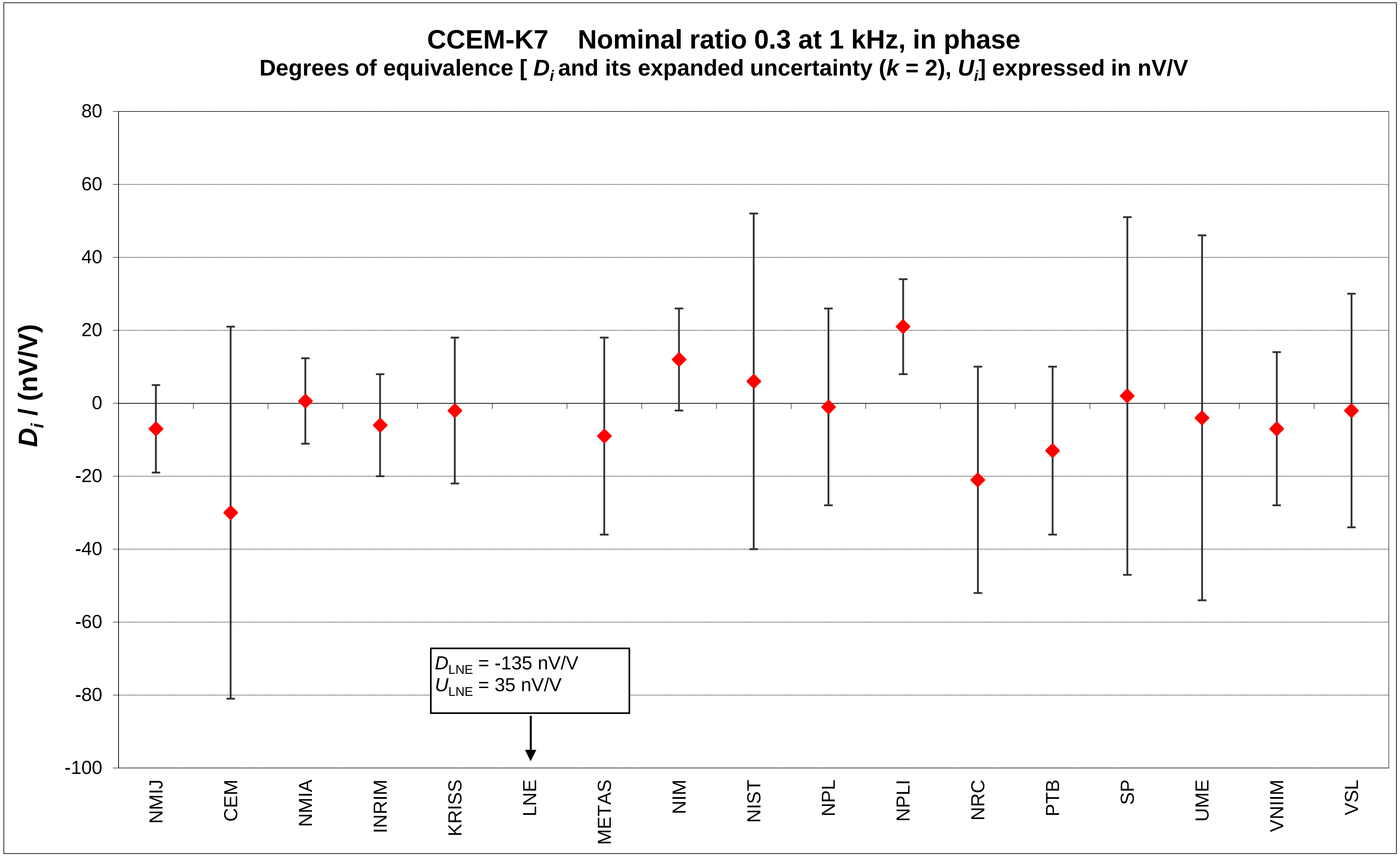
NRC
PTB
SP
UME
VNIIM
VSL

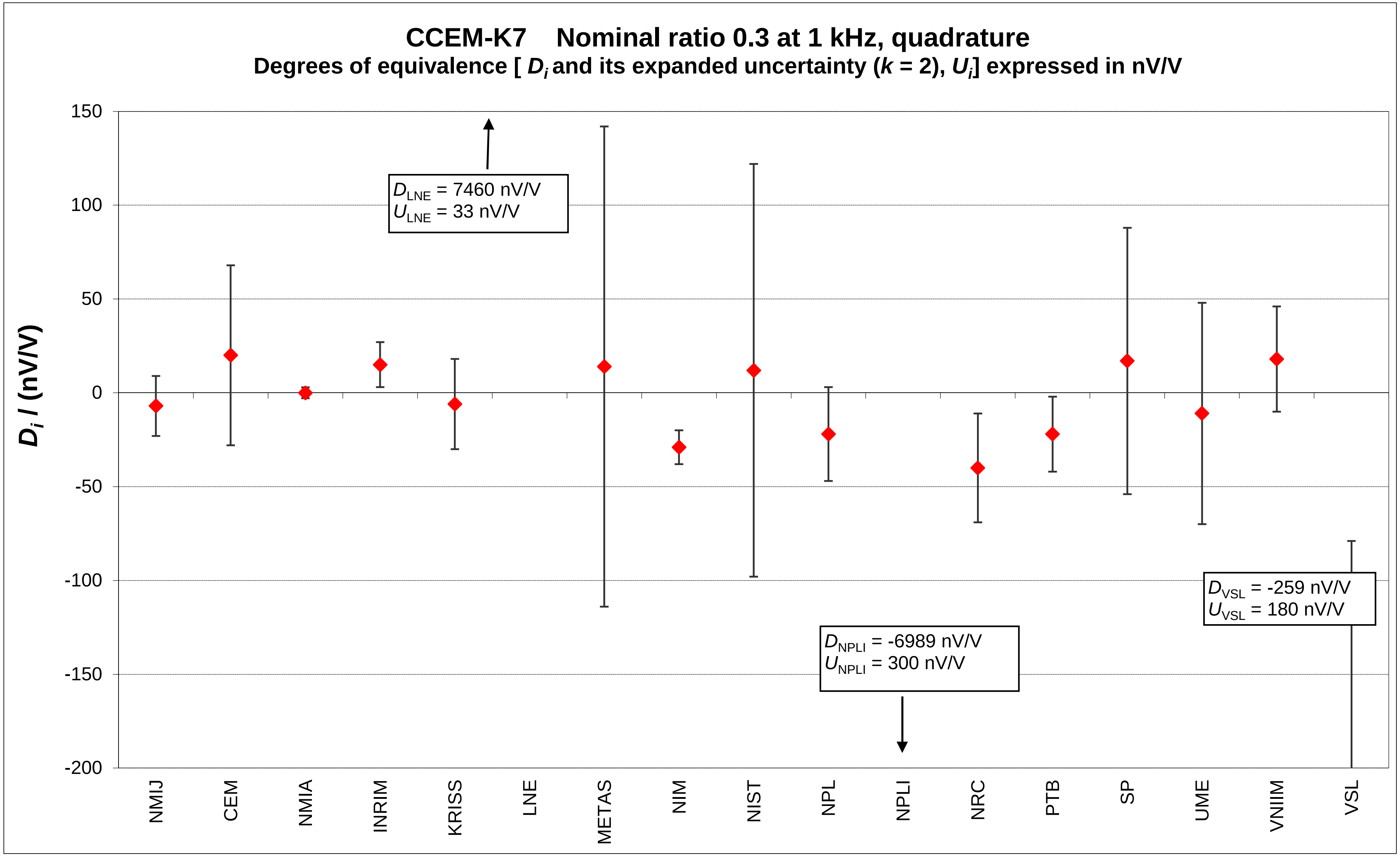

CCEM-K7 Nominal ratio 0.5 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -3293 nV/V
U_{LNE} = 36 nV/V
D_{NPLI} = -9080 nV/V
U_{NPLI} = 300 nV/V
D_{VSL} = -390 nV/V
U_{VSL} = 230 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.4 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

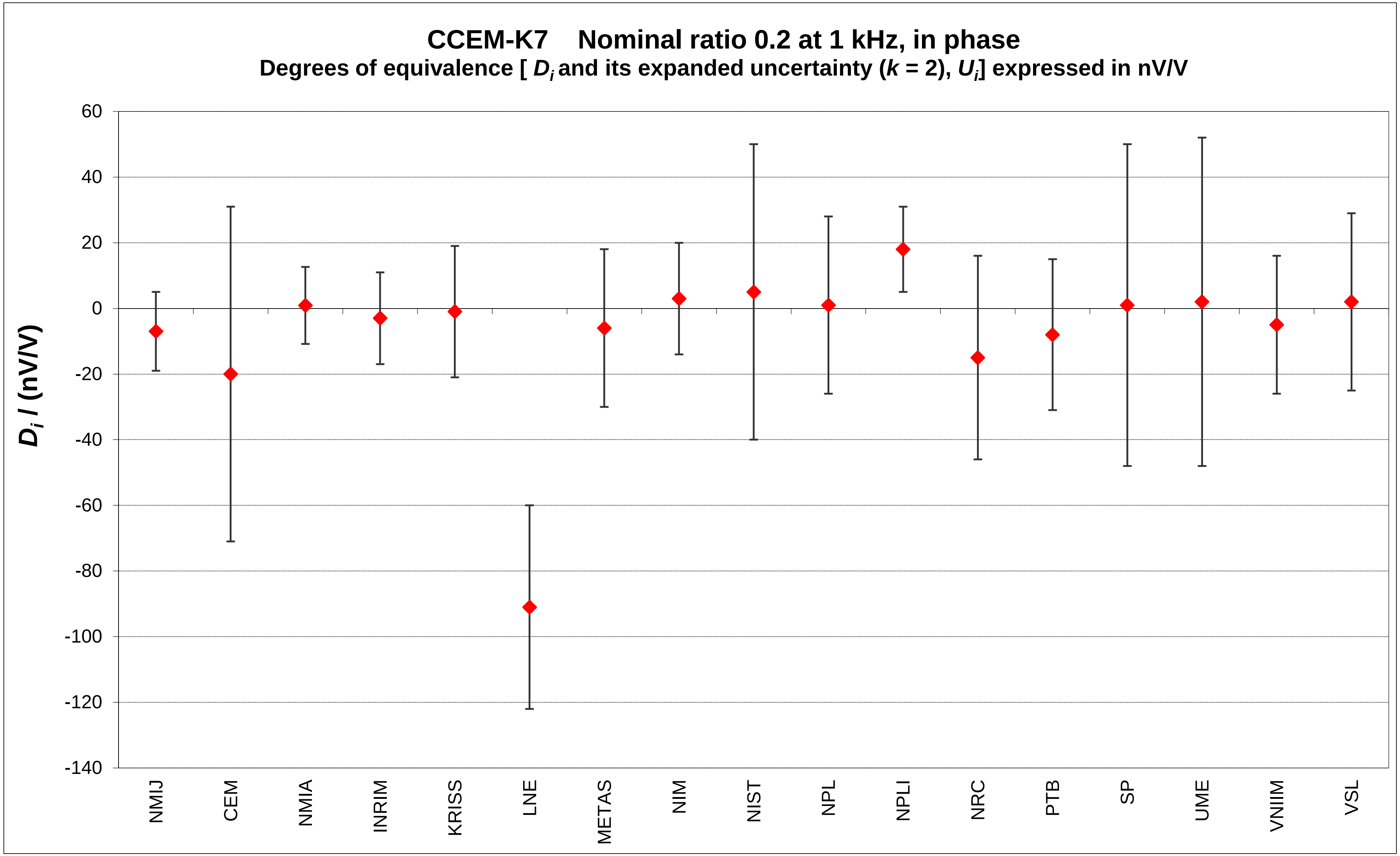


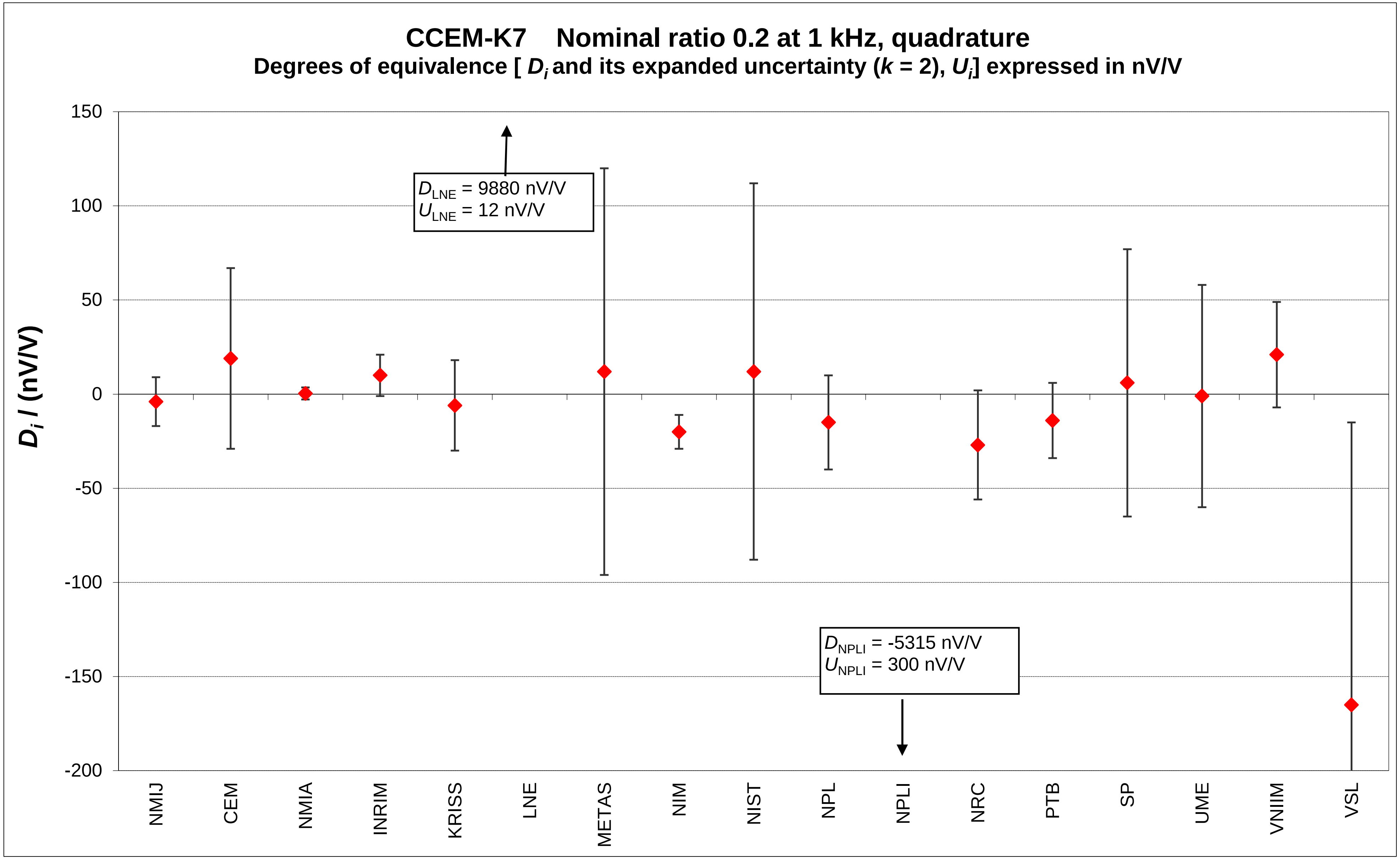
CCEM-K7 Nominal ratio 0.4 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 2176 nV/V
U_{LNE} = 35 nV/V
D_{NPLI} = -8333 nV/V
U_{NPLI} = 300 nV/V
D_{VSL} = 343 nV/V
U_{VSL} = 210 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

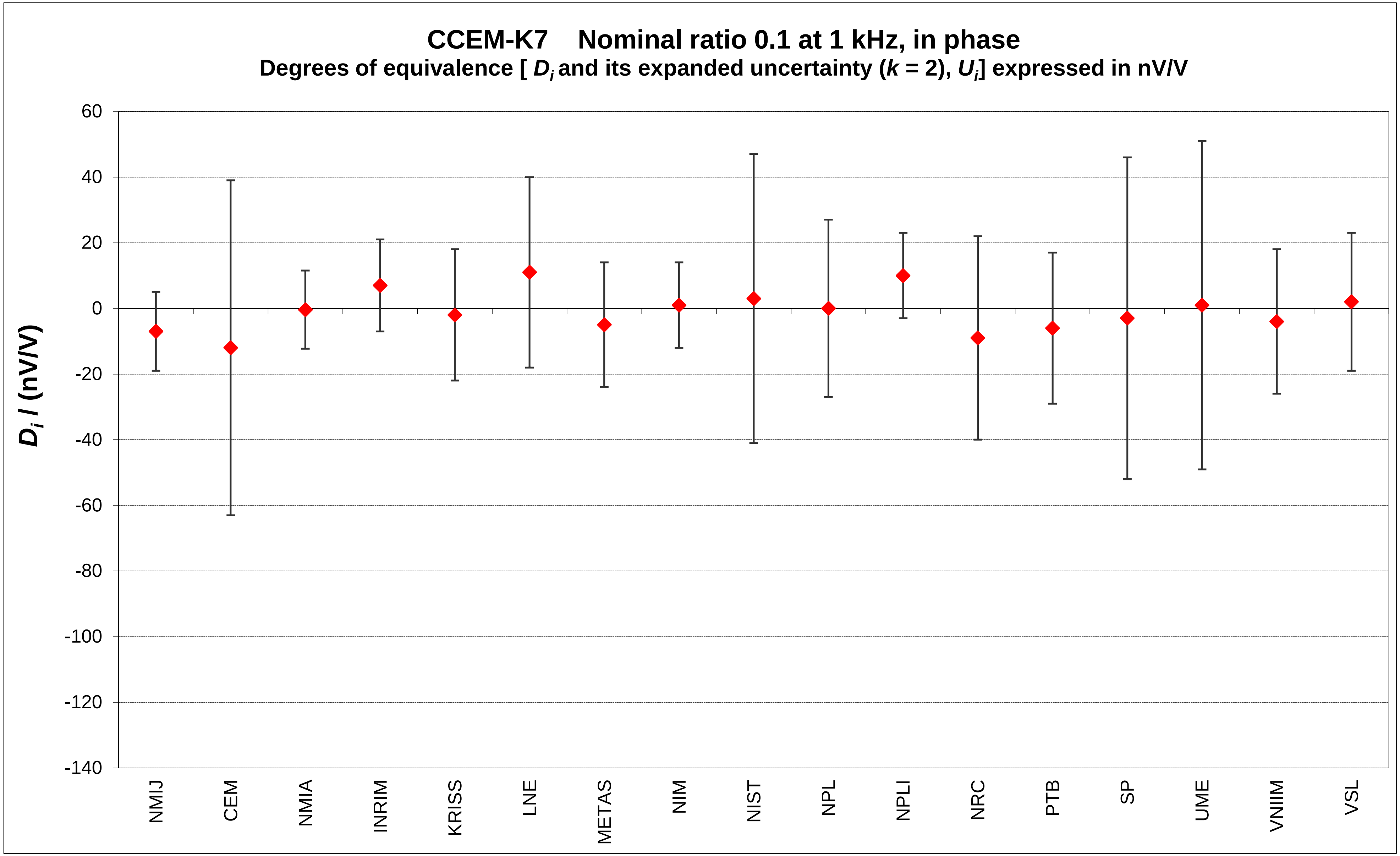

CCEM-K7 Nominal ratio 0.3 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
D_{LNE} = -135 nV/V
U_{LNE} = 35 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



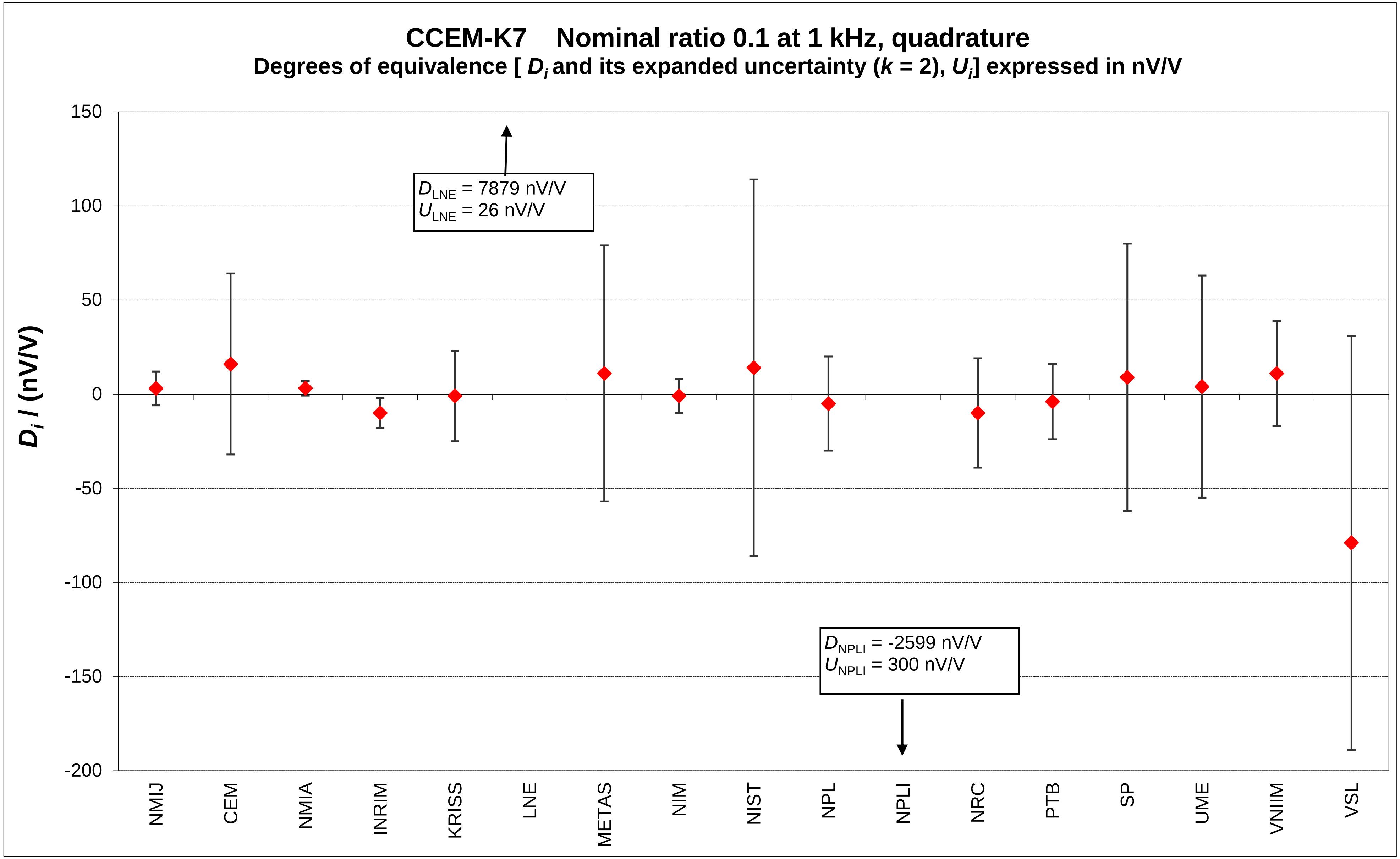
CCEM-K7 Nominal ratio 0.3 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 7460 nV/V
U_{LNE} = 33 nV/V
D_{VSL} = -259 nV/V
U_{VSL} = 180 nV/V
D_{NPLI} = -6989 nV/V
U_{NPLI} = 300 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.2 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

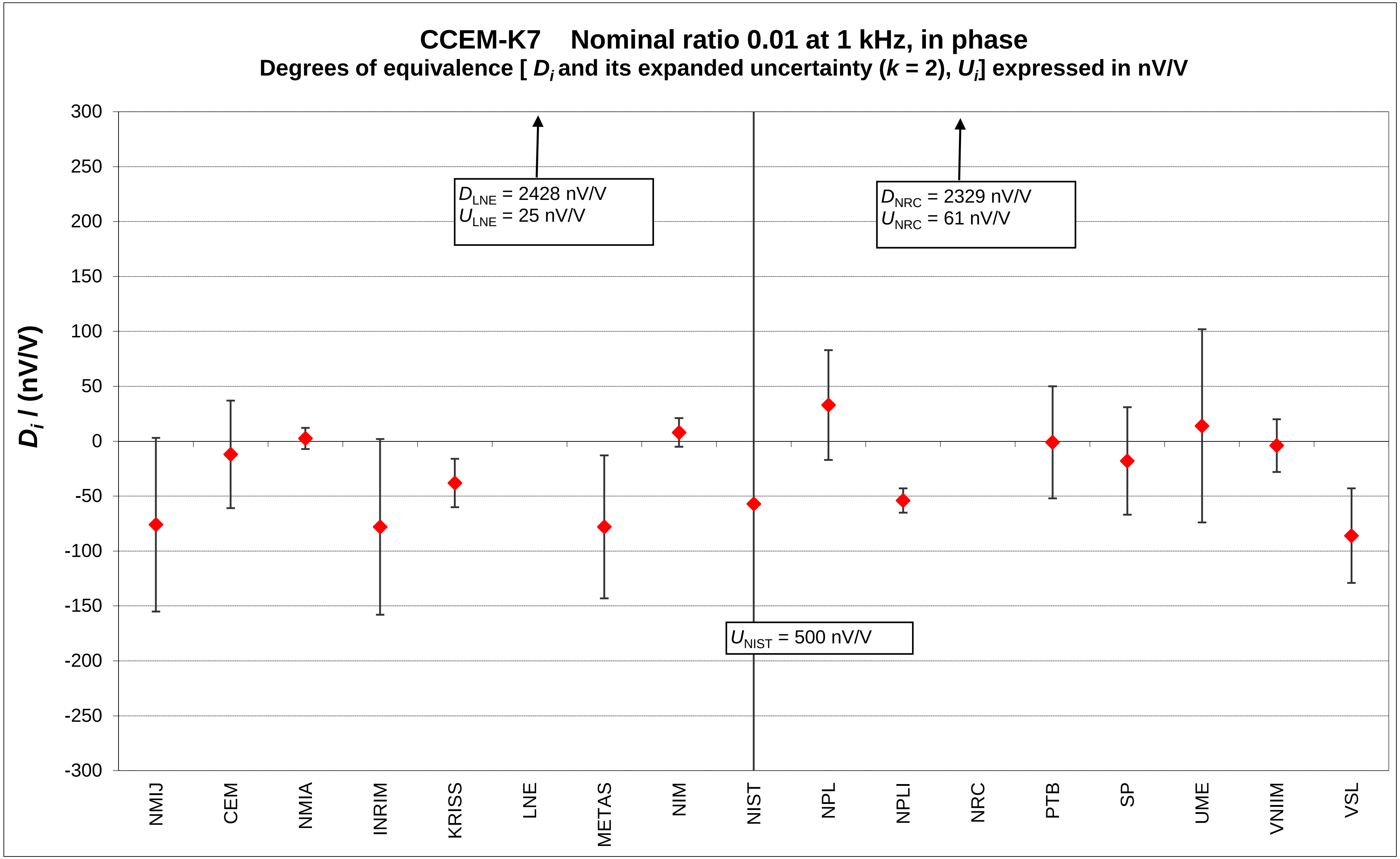

CCEM-K7 Nominal ratio 0.2 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 9880 nV/V
U_{LNE} = 12 nV/V
D_{NPLI} = -5315 nV/V
U_{NPLI} = 300 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

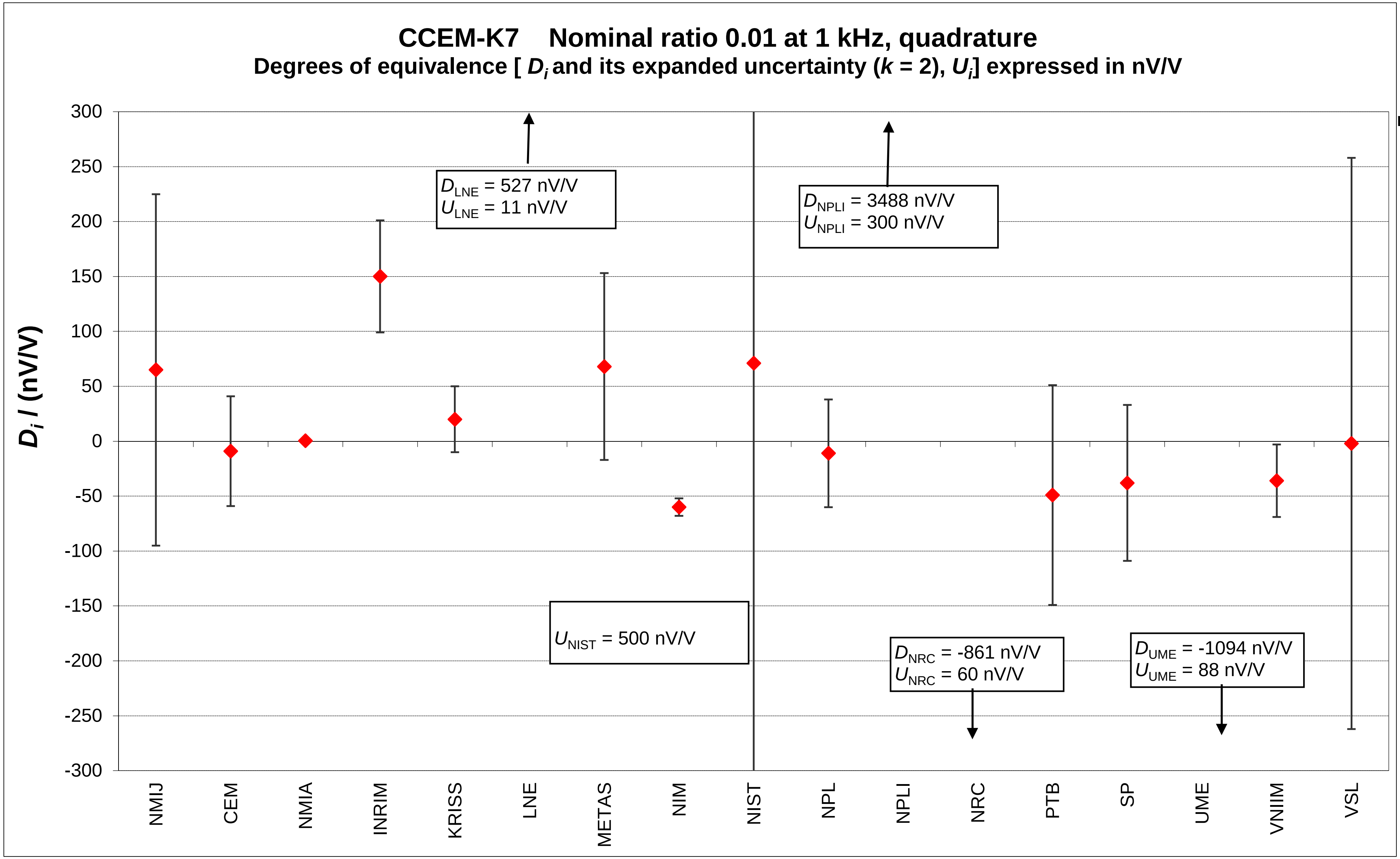


CCEM-K7 Nominal ratio 0.1 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



CCEM-K7 Nominal ratio 0.1 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 7879 nV/V
U_{LNE} = 26 nV/V
D_{NPLI} = -2599 nV/V
U_{NPLI} = 300 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 0.01 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
D_{LNE} = 2428 nV/V
U_{LNE} = 25 nV/V
D_{NRC} = 2329 nV/V
U_{NRC} = 61 nV/V
U_{NIST} = 500 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



CCEM-K7 Nominal ratio 0.01 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
D_{LNE} = 527 nV/V
U_{LNE} = 11 nV/V
D_{NPLI} = 3488 nV/V
U_{NPLI} = 300 nV/V
U_{NIST} = 500 nV/V
D_{NRC} = -861 nV/V
U_{NRC} = 60 nV/V
D_{UME} = -1094 nV/V
U_{UME} = 88 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

MEASURAND : **AC Voltage ratio**
NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1; Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11**
FREQUENCY : **1 kHz**

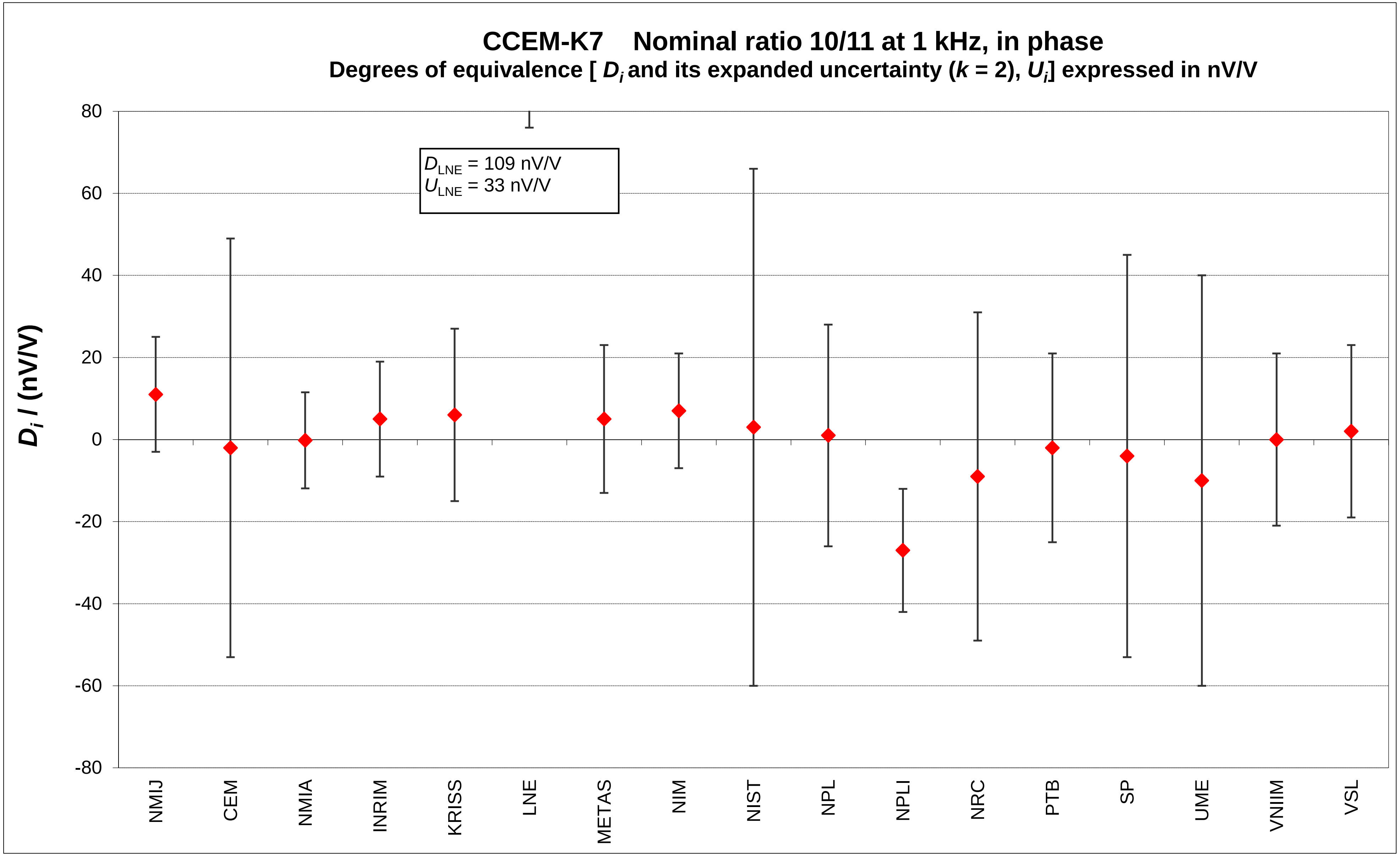
Table of Degrees of equivalence

Voltage ratio	10/11				9/11				8/11				7/11				6/11			
	In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature	
Lab *i* ⇩	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)	D_i / (nV/V)	U_i / (nV/V)
NMIJ	**11**	14	**-9**	32	**6**	14	**-11**	29	**2**	14	**-17**	27	**-2**	13	**-14**	25	**0**	13	**-16**	23
CEM	**-2**	51	**10**	48	**-20**	51	**20**	48	**-17**	51	**25**	48	**-30**	51	**36**	48	**-28**	51	**38**	48
NMIA	**-0.2**	11.7	**2.5**	3.5	**1.0**	11.7	**1.9**	3.1	**0.4**	11.6	**-1.1**	3.3	**-2.2**	11.6	**1.6**	2.7	**-1.4**	11.6	**0.5**	2.9
INRIM	**5**	14	**-3**	8	**3**	13	**1**	10	**2**	14	**4**	12	**11**	14	**-22**	13	**-1**	13	**11**	13
KRISS	**6**	21	**-6**	24	**3**	21	**-14**	24	**2**	21	**-25**	24	**-2**	21	**-31**	24	**-2**	21	**-35**	24
LNE	**109**	33	**-9902**	690	**262**	36	**-14320**	690	**323**	39	**-14532**	690	**304**	41	**-12227**	690	**193**	42	**-8656**	690
METAS	**5**	18	**0**	50	**2**	22	**3**	74	**0**	27	**3**	103	**-3**	29	**10**	114	**-2**	30	**9**	124
NIM	**7**	14	**8**	12	**12**	14	**8**	16	**11**	14	**9**	9	**17**	14	**4**	12	**16**	14	**-8**	12
NIST	**3**	63	**9**	120	**7**	65	**18**	130	**8**	67	**20**	130	**8**	68	**25**	130	**10**	69	**21**	130
NPL	**1**	27	**-10**	25	**1**	27	**-17**	25	**0**	27	**-24**	25	**-3**	27	**-24**	25	**-2**	27	**-27**	25
NPLI	**-27**	15	**-3496**	500	**-15**	15	**-6313**	500	**-5**	15	**-8249**	500	**2**	15	**-9553**	500	**11**	15	**-10164**	500
NRC	**-9**	40	**-33**	38	**-20**	40	**-56**	38	**-27**	40	**-74**	38	**-33**	40	**-78**	38	**-33**	40	**-82**	38
PTB	**-2**	23	**-13**	20	**-5**	23	**-22**	20	**-7**	23	**-31**	20	**-11**	23	**-31**	20	**-8**	23	**-35**	20
SP	**-4**	49	**-1**	71	**-1**	49	**-10**	71	**-13**	49	**0**	71	**-7**	49	**1**	71	**-13**	49	**6**	71
UME	**-10**	50	**-21**	59	**-15**	50	**-28**	59	**-18**	50	**-34**	59	**-20**	50	**-29**	59	**-19**	50	**-28**	59
VNIIM	**0**	21	**9**	28	**-2**	21	**15**	28	**-3**	21	**15**	28	**-9**	21	**20**	28	**-8**	21	**17**	28
VSL	**2**	21	**-86**	120	**-10**	27	**-203**	160	**-11**	32	**-339**	190	**-20**	37	**-453**	210	**-17**	42	**-514**	230

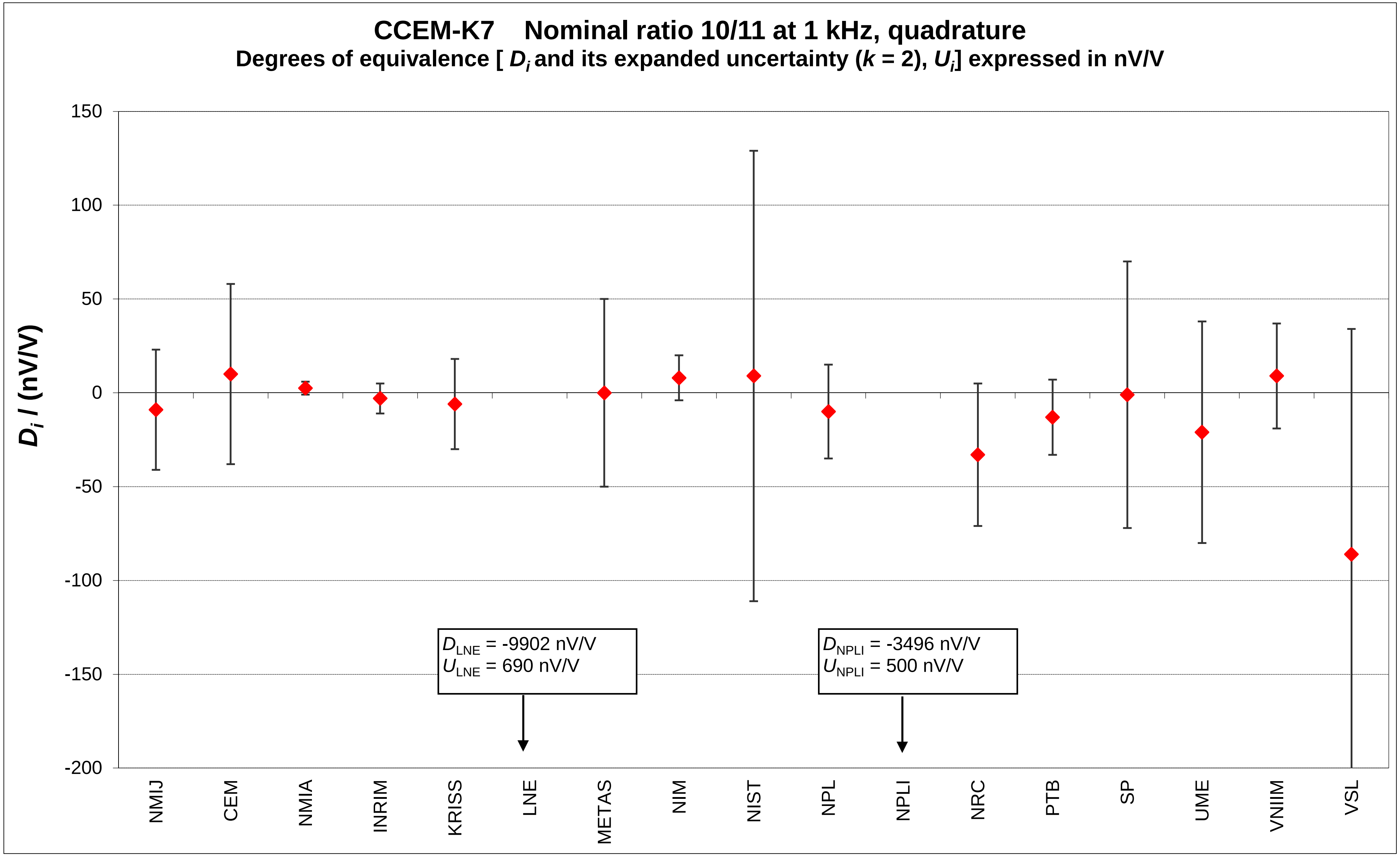
MEASURAND : **AC Voltage ratio**
NOMINAL VALUES : **Ten decimal ratio values : 0.01, and 0.1 to 0.9 by step of 0.1; Ten elevenths ratio values : 1/11 to 10/11 by step of 1/11**
FREQUENCY : **1 kHz**

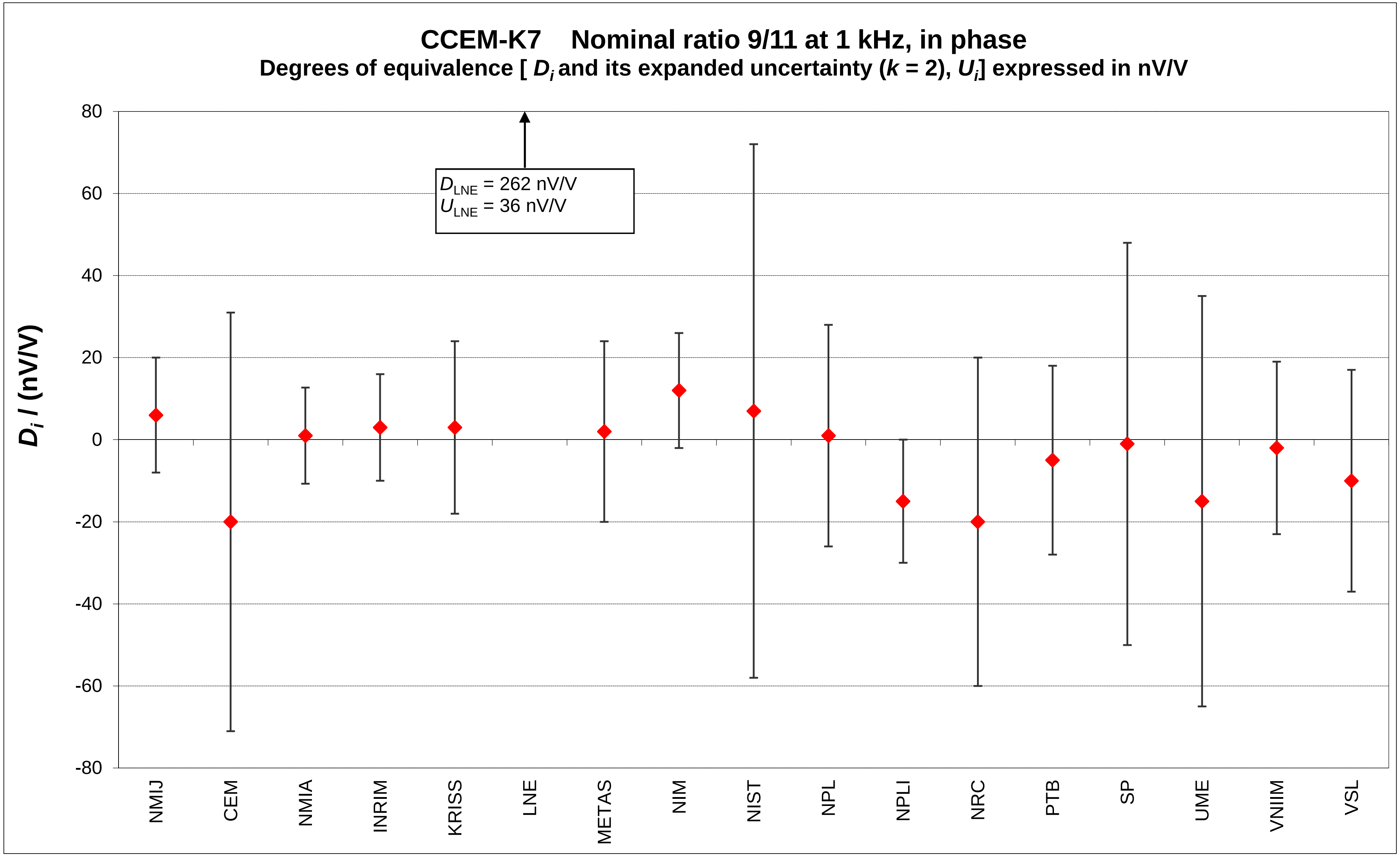
Table of Degrees of equivalence

Voltage ratio	5/11				4/11				3/11				2/11				1/11			
	In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature		In phase		Quadrature	
Lab *i* ⇩	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i	D_i / (nV/V)	U_i
NMIJ	**3**	13	**-16**	21	**2**	12	**-8**	18	**3**	12	**-5**	15	**1**	12	**-2**	12	**0**	12	**4**	9
CEM	**-32**	51	**38**	48	**-31**	51	**41**	50	**-29**	51	**37**	50	**-23**	51	**29**	50	**-14**	51	**20**	50
NMIA	**-3.4**	11.6	**0.9**	2.5	**-2.5**	11.6	**2.8**	3.0	**-4.2**	11.7	**3.6**	3.2	**-1.6**	11.7	**1.1**	3.2	**-0.2**	11.8	**2.4**	3.7
INRIM	**5**	16	**2**	13	**3**	16	**7**	13	**6**	16	**6**	13	**0**	13	**7**	11	**11**	15	**-13**	13
KRISS	**-4**	21	**-34**	24	**-4**	21	**-19**	24	**-3**	21	**-6**	24	**-2**	21	**4**	24	**-1**	22	**2**	24
LNE	**-33**	42	**-4087**	690	**-132**	41	**1000**	690	**-238**	39	**5338**	690	**-170**	36	**7062**	690	**-62**	37	**4893**	35
METAS	**-3**	31	**9**	137	**-5**	33	**14**	146	**-5**	31	**13**	138	**-6**	27	**9**	113	**-4**	21	**9**	71
NIM	**15**	14	**-30**	20	**16**	14	**-7**	20	**14**	12	**-8**	12	**15**	12	**-25**	12	**10**	12	**-4**	9
NIST	**8**	69	**19**	130	**7**	69	**17**	130	**6**	67	**14**	130	**5**	65	**6**	120	**5**	63	**6**	120
NPL	**-3**	27	**-26**	25	**-4**	27	**-22**	25	**-4**	27	**-17**	25	**-3**	27	**-14**	25	**-1**	27	**-6**	25
NPLI	**12**	15	**-9485**	500	**7**	15	**-8323**	500	**7**	15	**-6918**	500	**6**	15	**-4519**	500	**6**	15	**-2260**	500
NRC	**-32**	40	**-77**	38	**-29**	40	**-65**	38	**-25**	40	**-51**	38	**-17**	40	**-37**	38	**-9**	40	**-16**	38
PTB	**-9**	23	**-31**	20	**-12**	23	**-26**	20	**-13**	23	**-20**	20	**-13**	23	**-17**	20	**-9**	23	**-7**	20
SP	**-9**	49	**-10**	71	**-13**	49	**-7**	71	**-10**	49	**-24**	71	**-5**	49	**-27**	71	**-10**	49	**-23**	71
UME	**-18**	50	**-22**	59	**-18**	50	**-13**	59	**-15**	50	**-5**	59	**-12**	50	**-1**	59	**-5**	50	**6**	59
VNIIM	**-11**	21	**19**	28	**-14**	21	**16**	28	**-13**	21	**14**	28	**-12**	21	**4**	28	**-5**	22	**2**	28
VSL	**-9**	42	**-505**	230	**-15**	37	**-463**	210	**-12**	32	**-358**	190	**-19**	27	**-239**	160	**-9**	21	**-110**	120

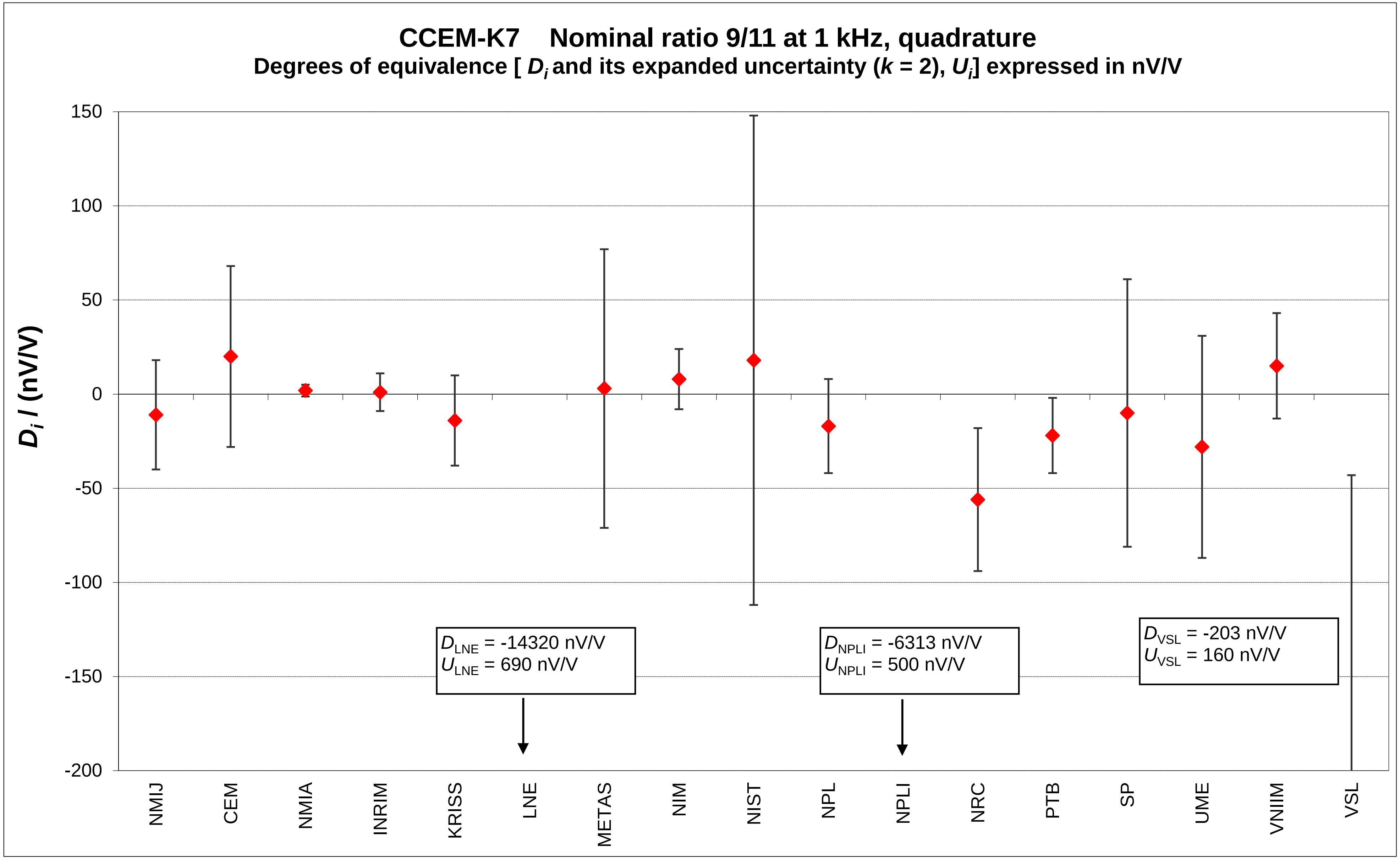


The BIPM key comparison database, June 2012

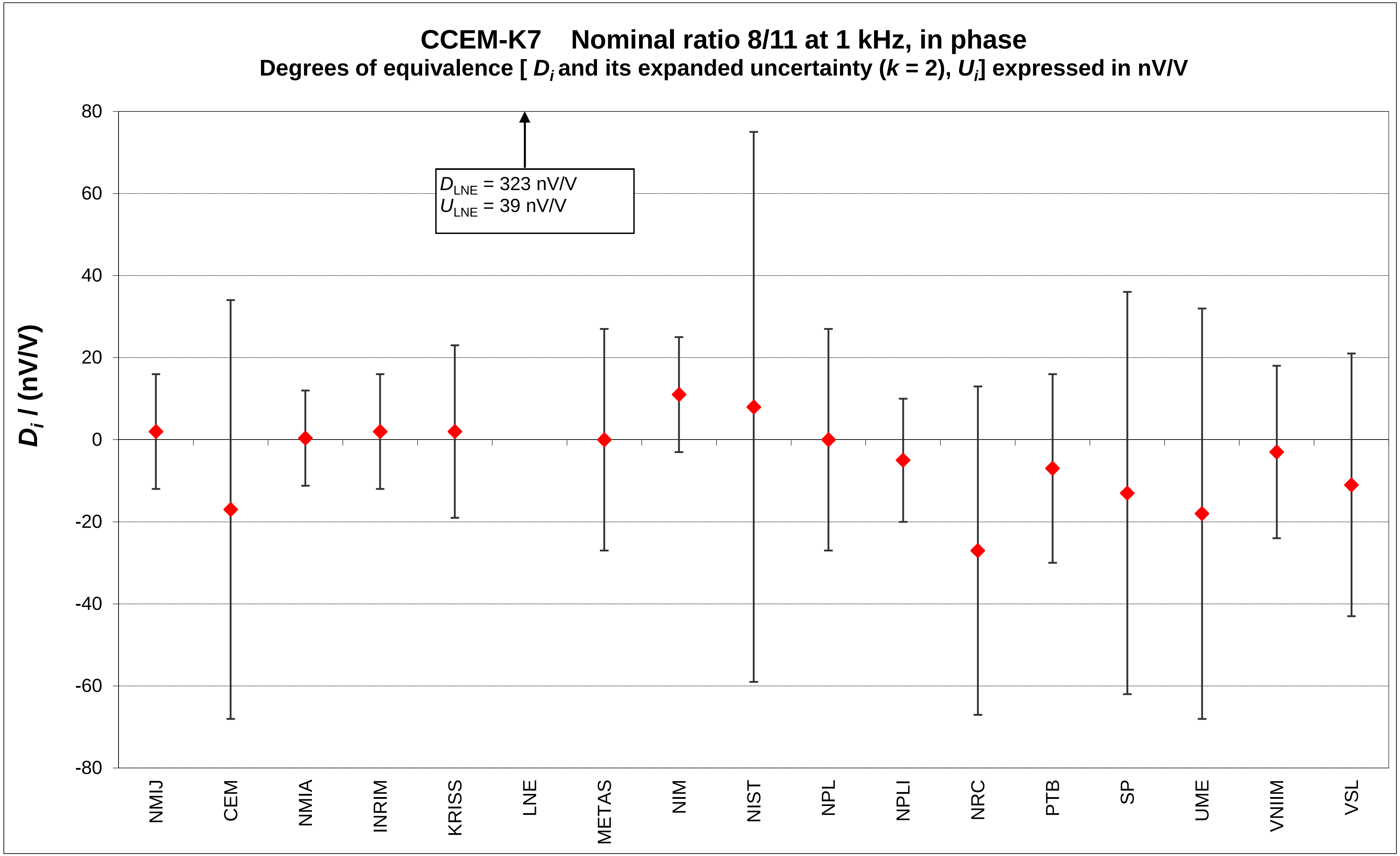

CCEM-K7 Nominal ratio 10/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_LNE = -9902 nV/V
U_LNE = 690 nV/V
D_NPLI = -3496 nV/V
U_NPLI = 500 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



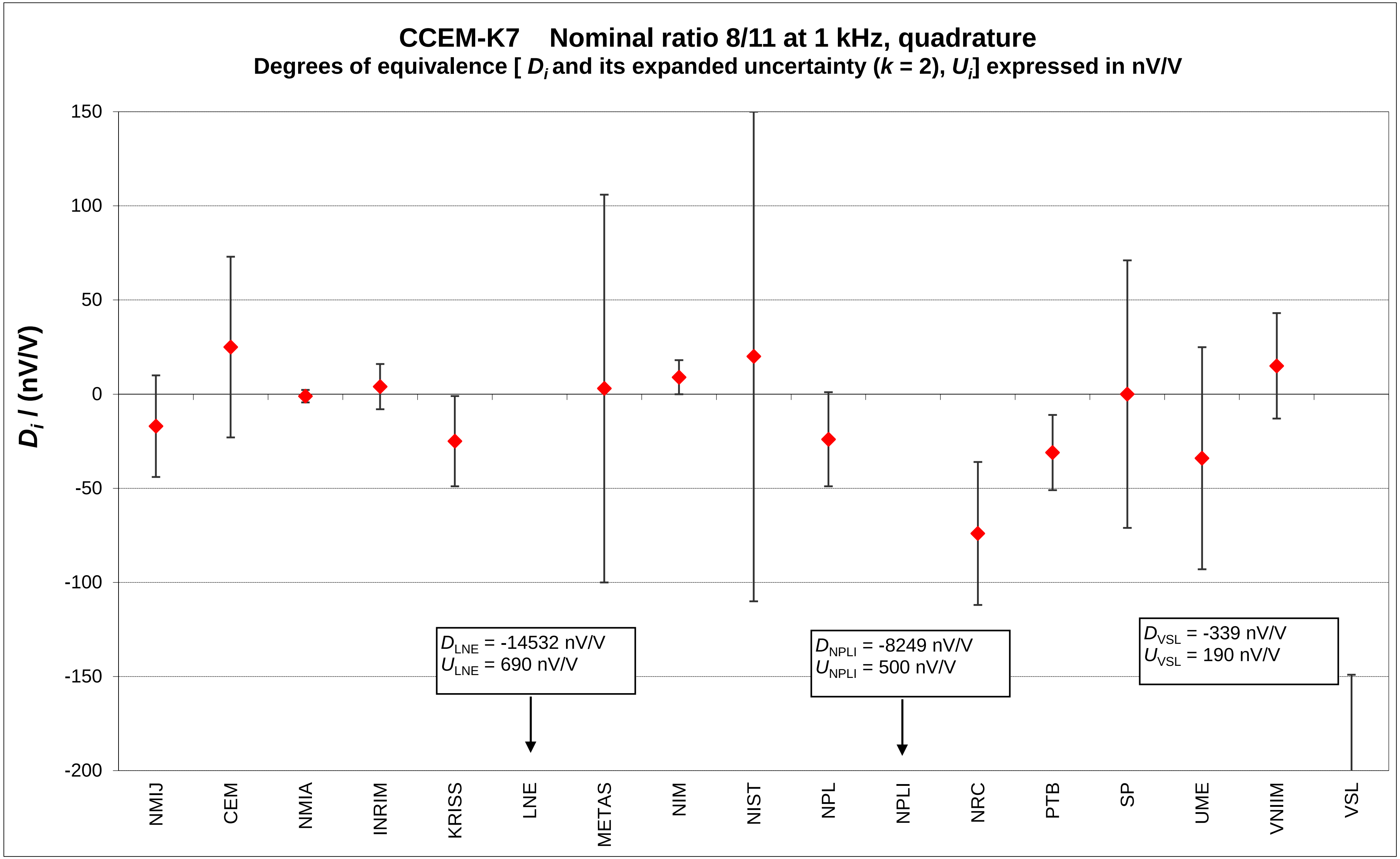
The BIPM key comparison database, June 2012

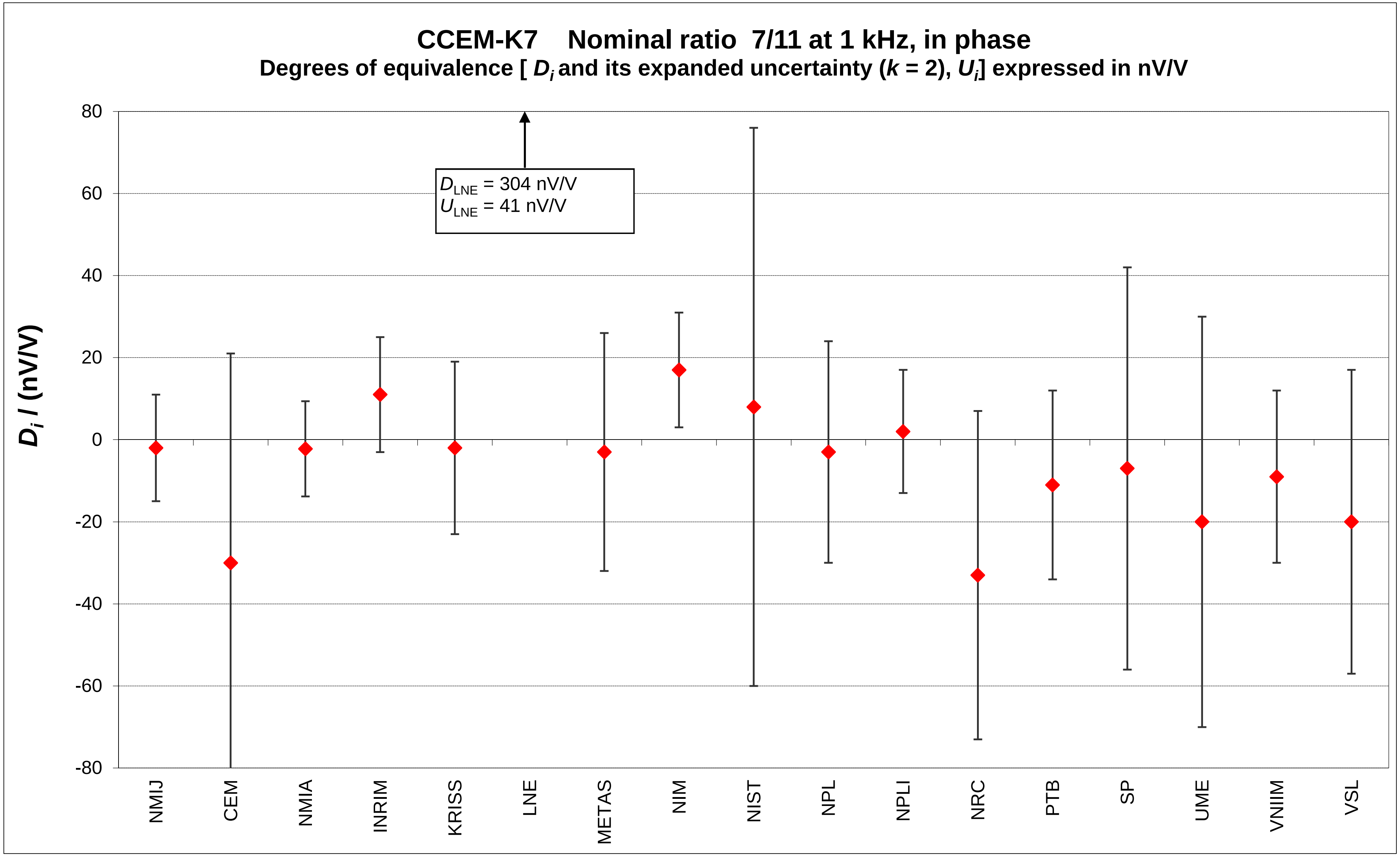


CCEM-K7 Nominal ratio 9/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -14320 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -6313 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -203 nV/V
U_{VSL} = 160 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

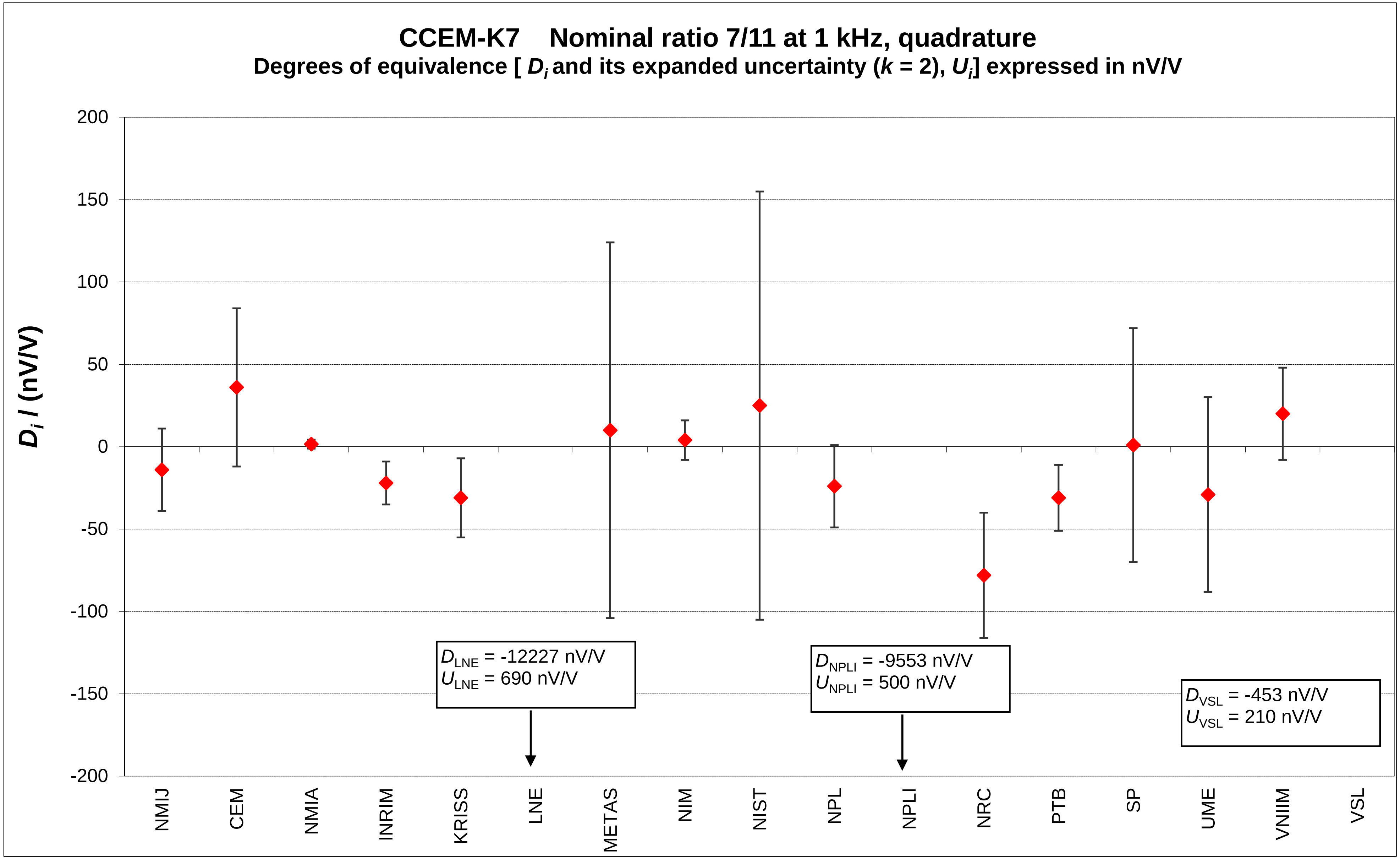


CCEM-K7 Nominal ratio 8/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_{LNE} = 323 nV/V
U_{LNE} = 39 nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

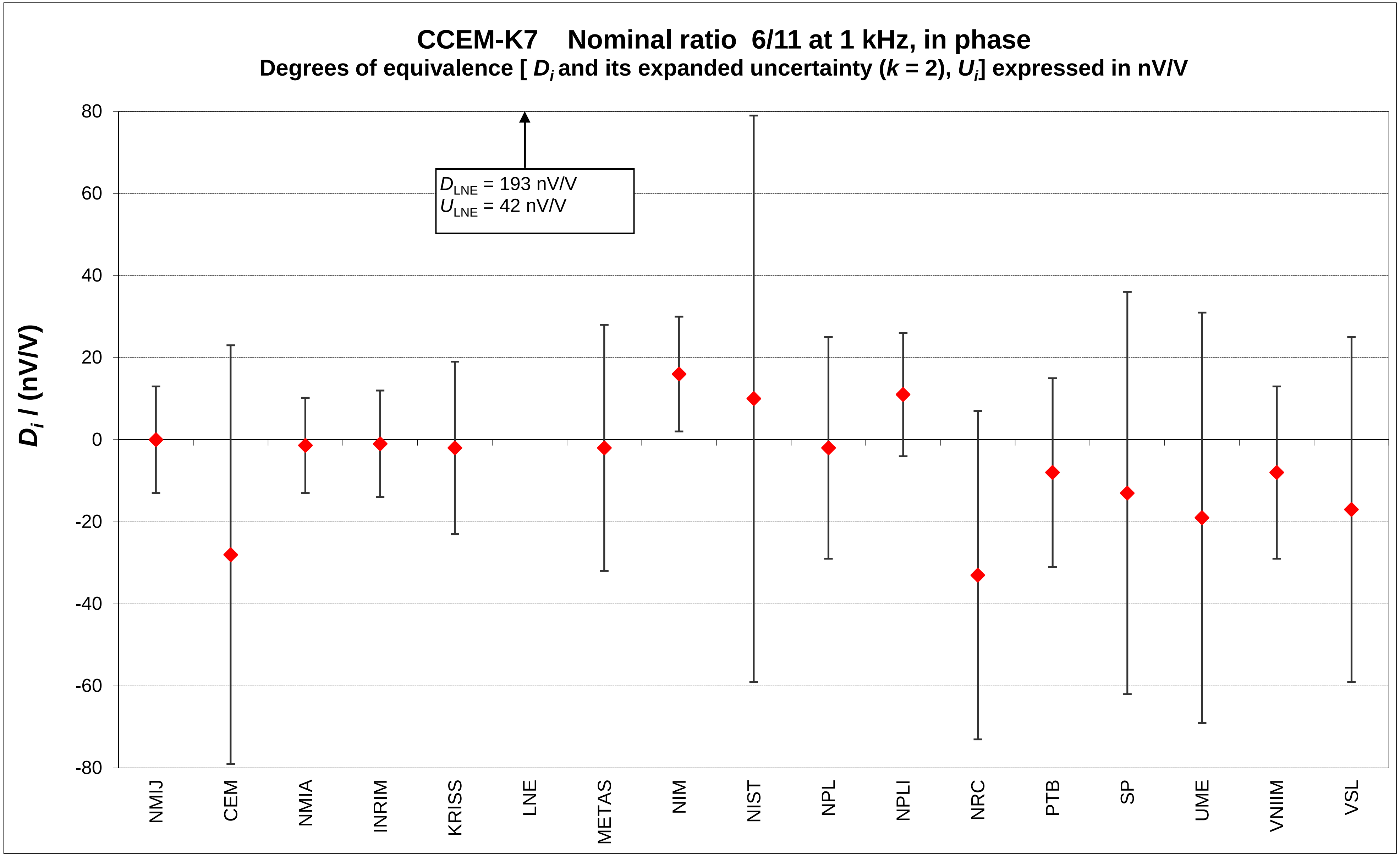

CCEM-K7 Nominal ratio 8/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -14532 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -8249 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -339 nV/V
U_{VSL} = 190 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



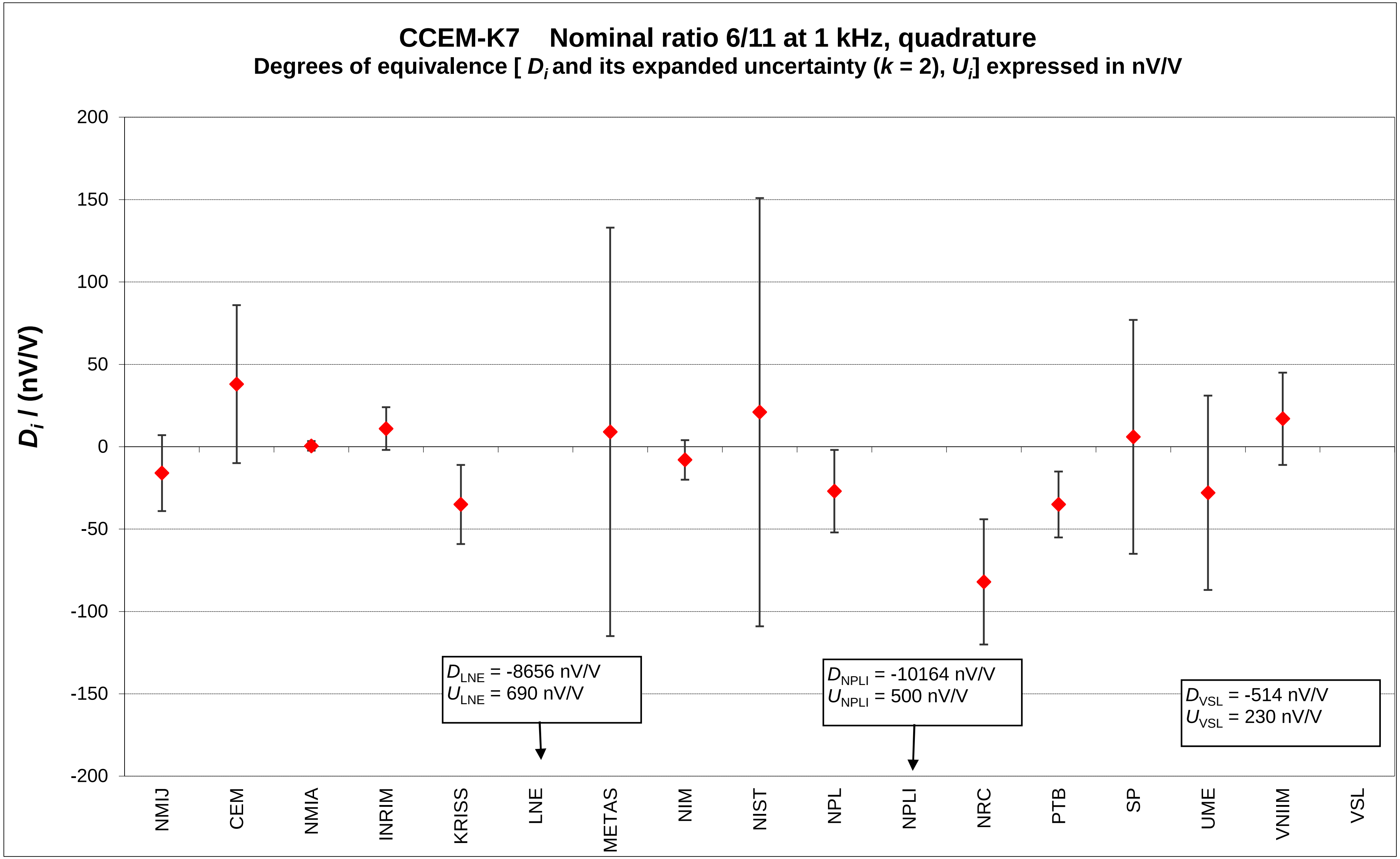
The BIPM key comparison database, June 2012



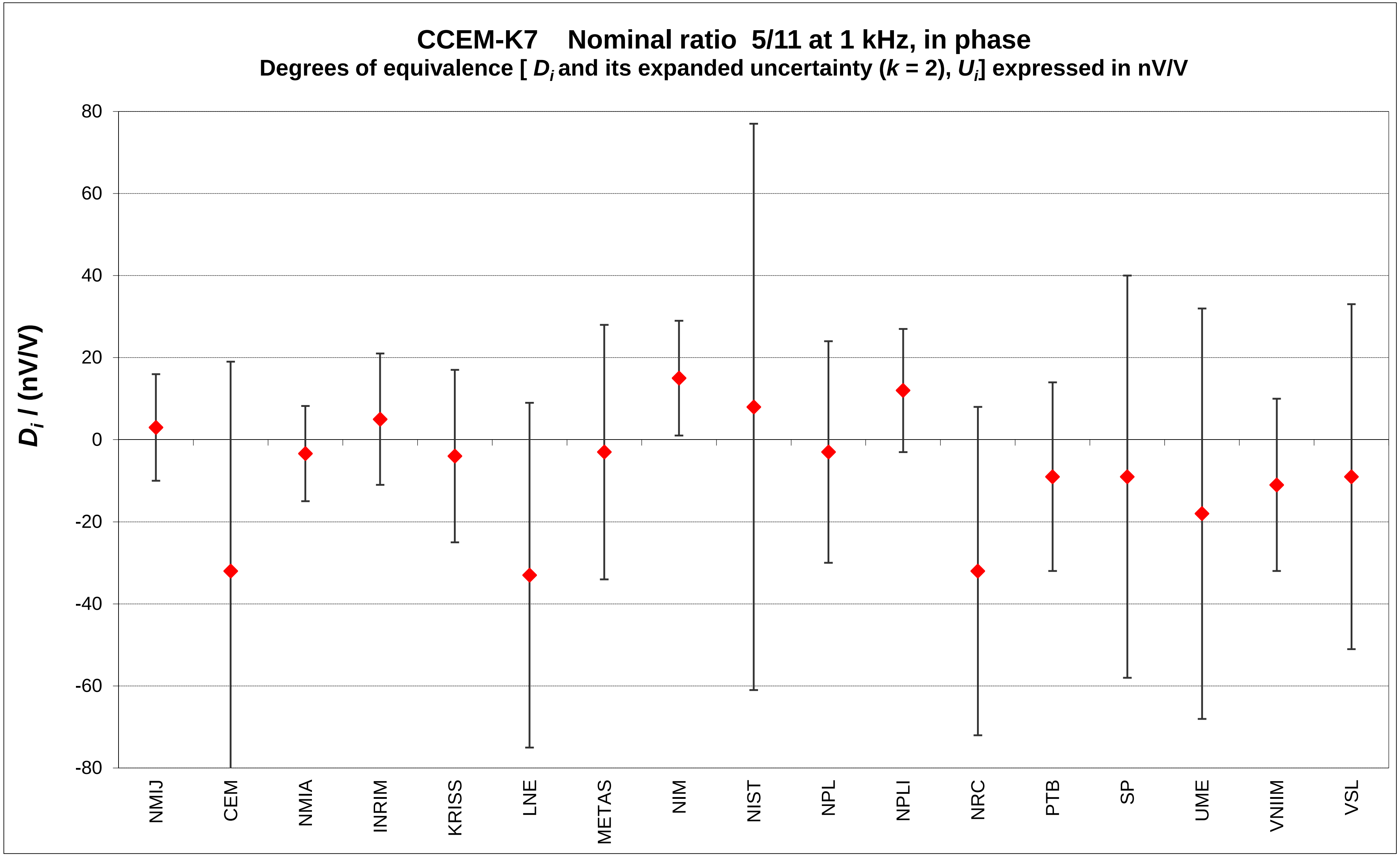
CCEM-K7 Nominal ratio 7/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -12227 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -9553 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -453 nV/V
U_{VSL} = 210 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

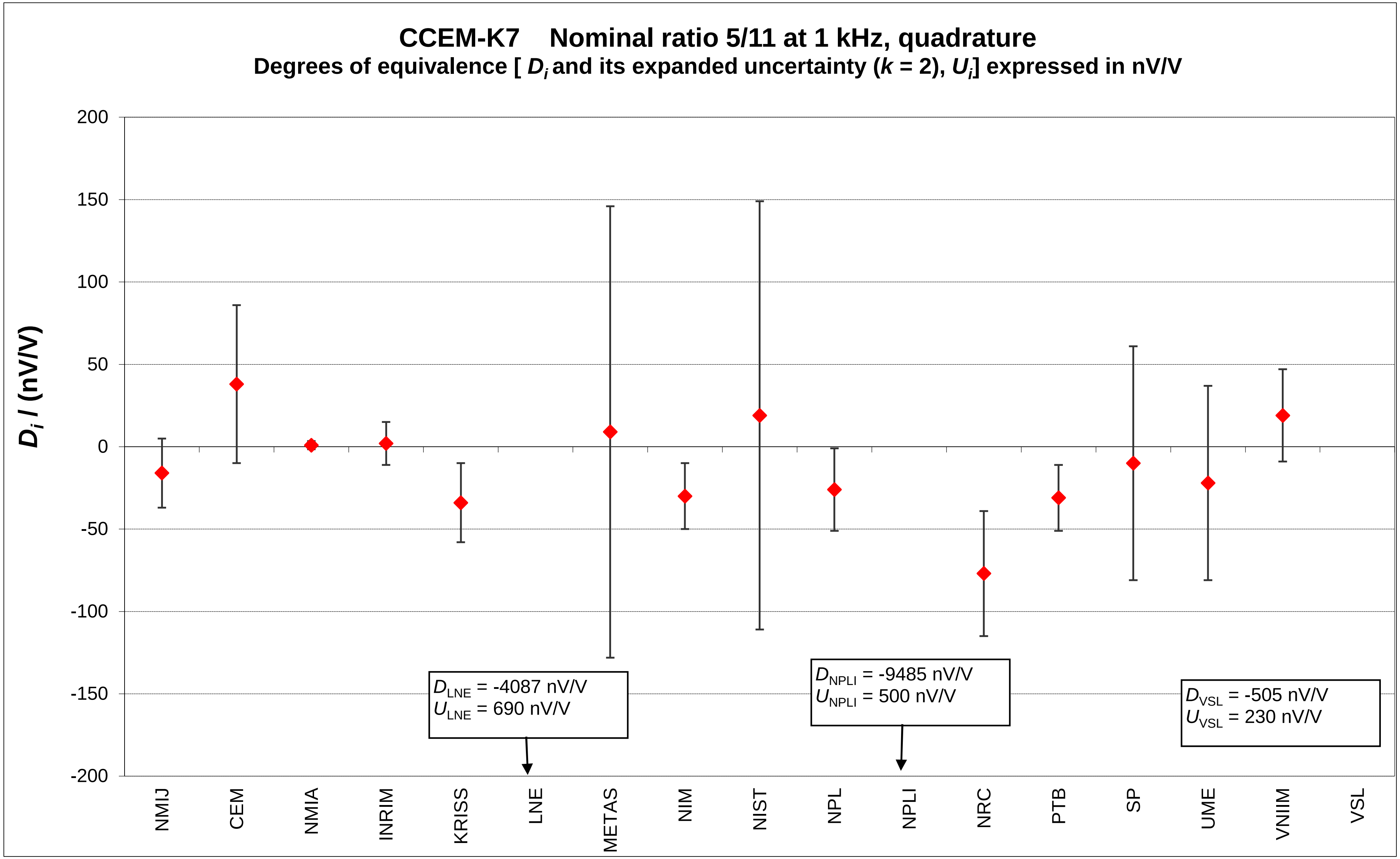


CCEM-K7 Nominal ratio 6/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_{LNE} = 193 nV/V
U_{LNE} = 42 nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

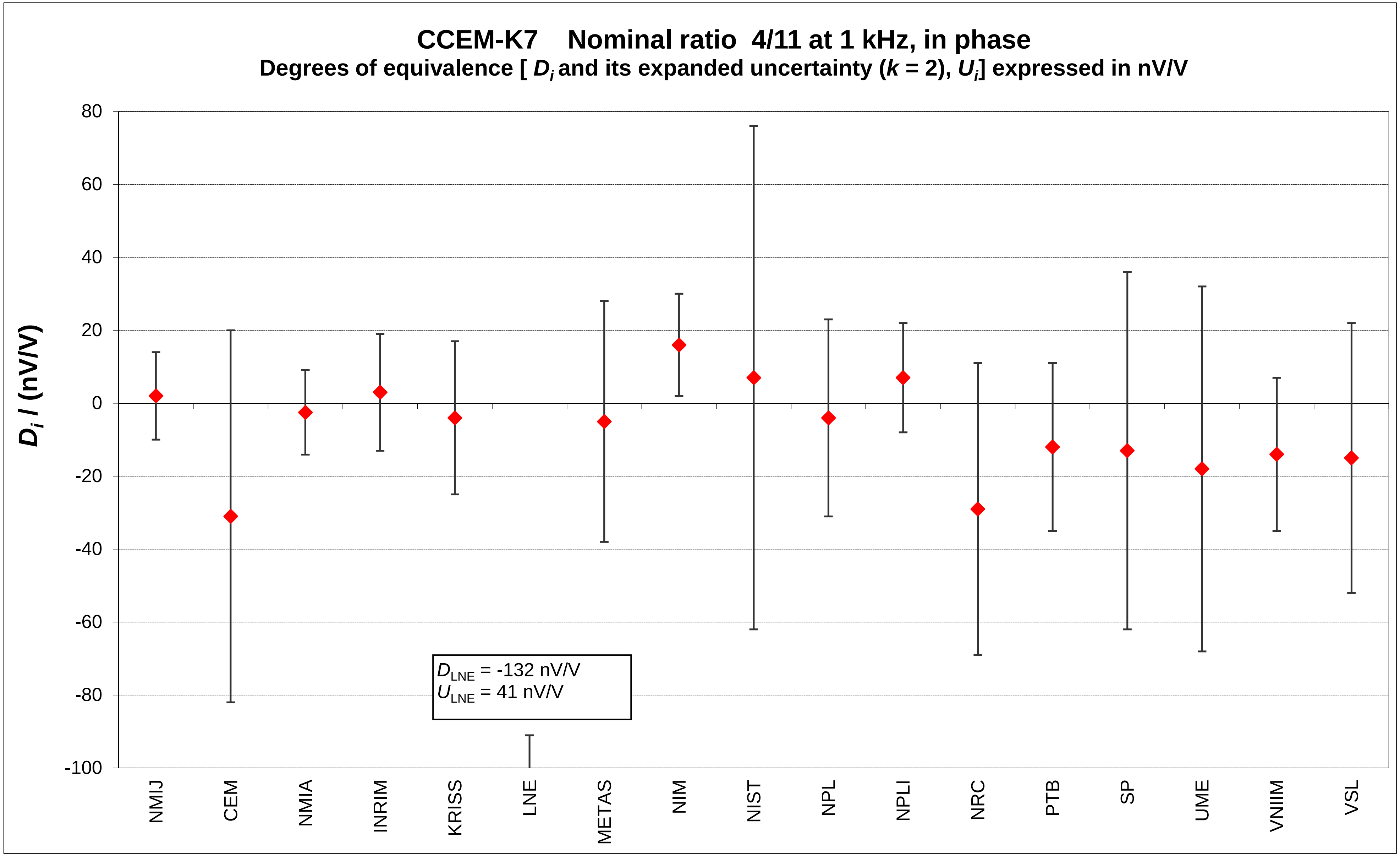


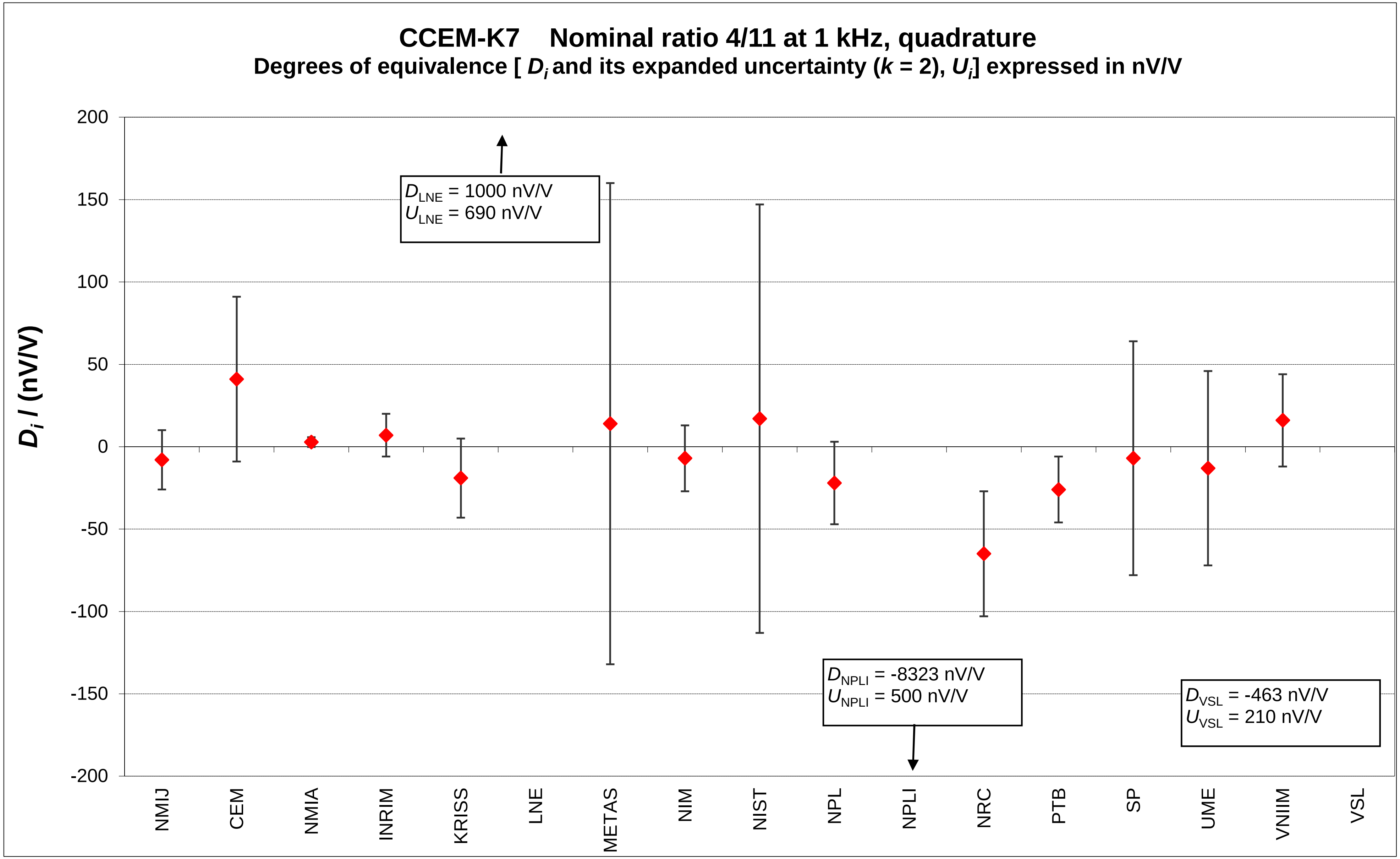
CCEM-K7 Nominal ratio 6/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -8656 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -10164 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -514 nV/V
U_{VSL} = 230 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

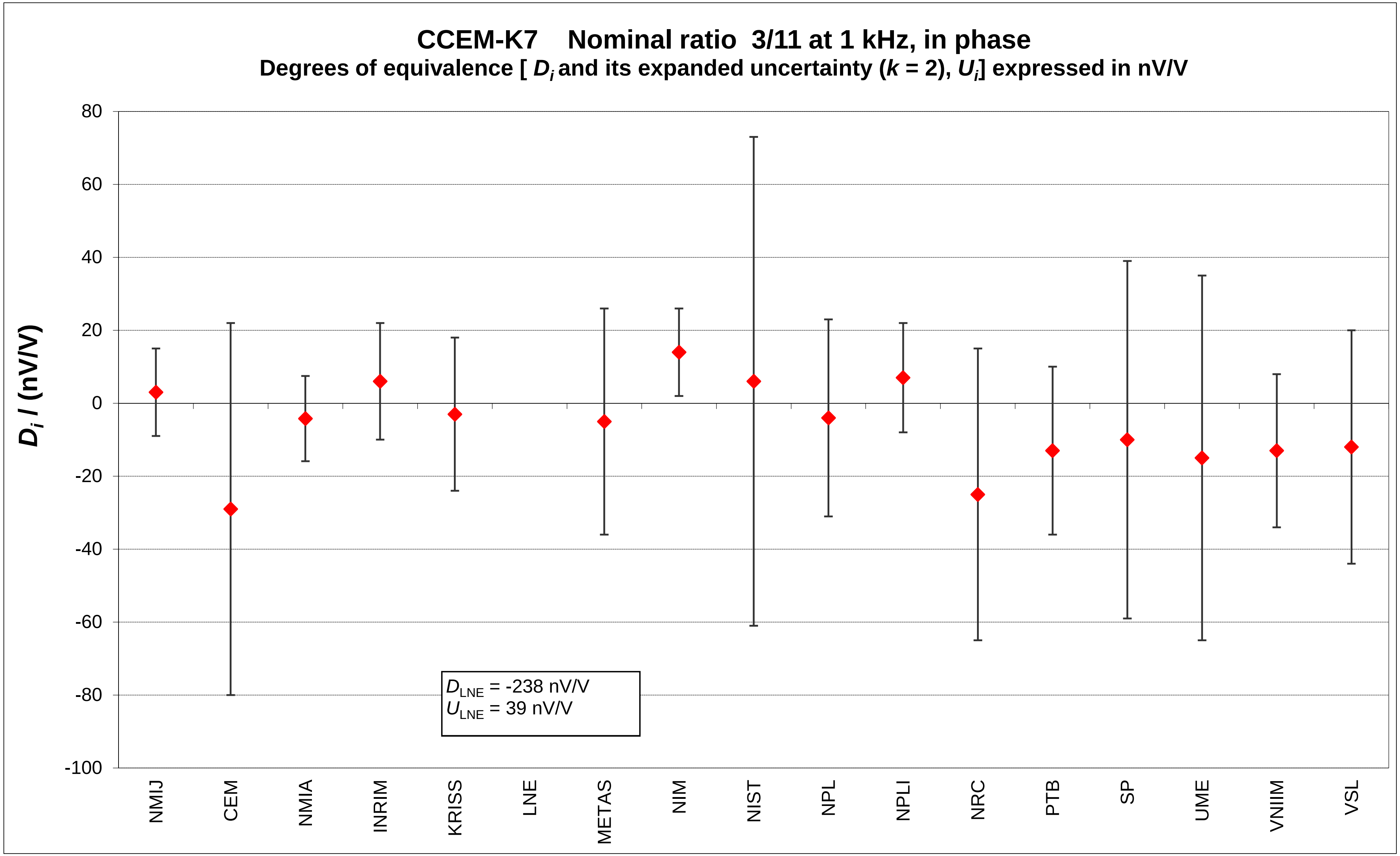

CCEM-K7 Nominal ratio 5/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

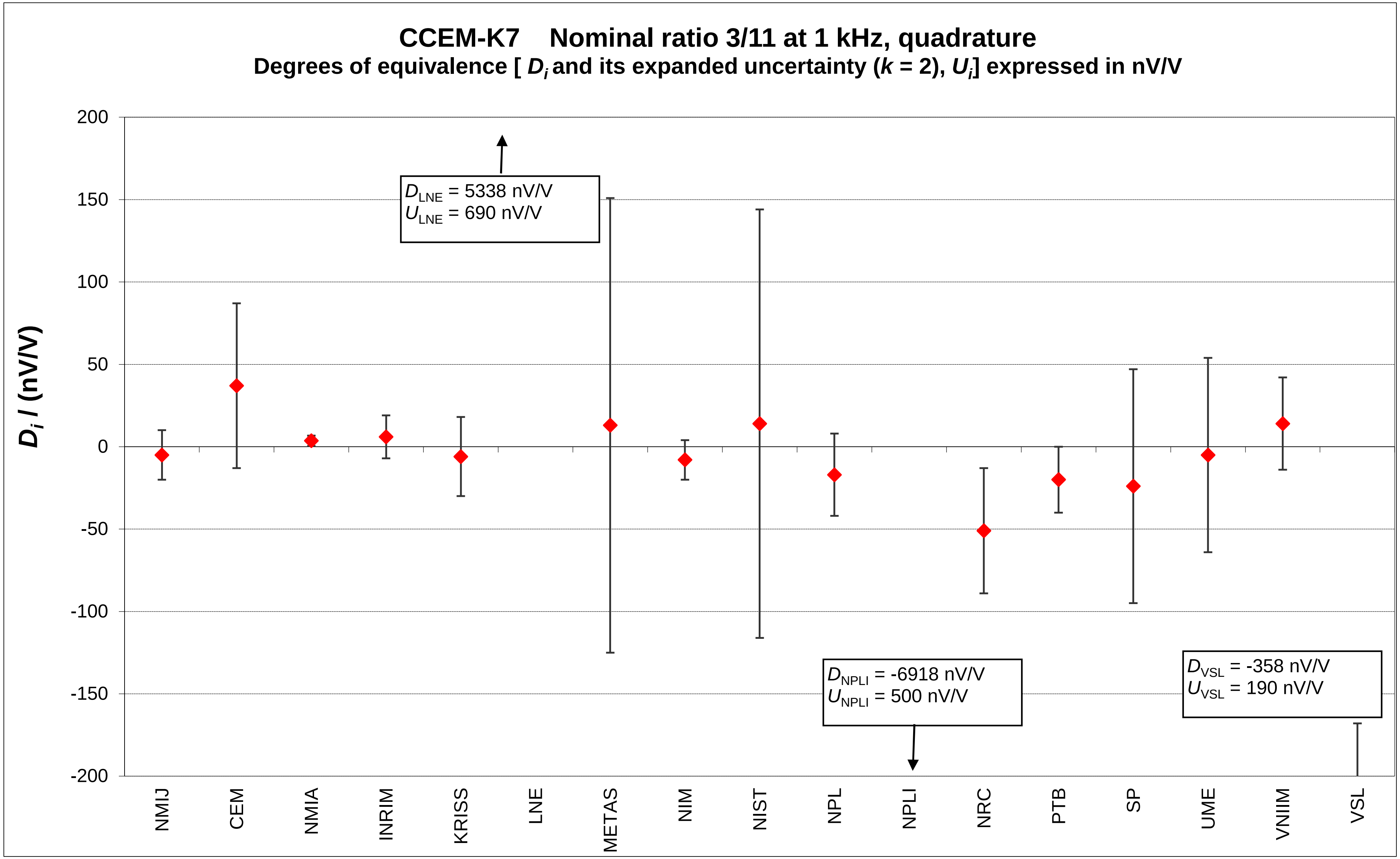


CCEM-K7 Nominal ratio 5/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = -4087 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -9485 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -505 nV/V
U_{VSL} = 230 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

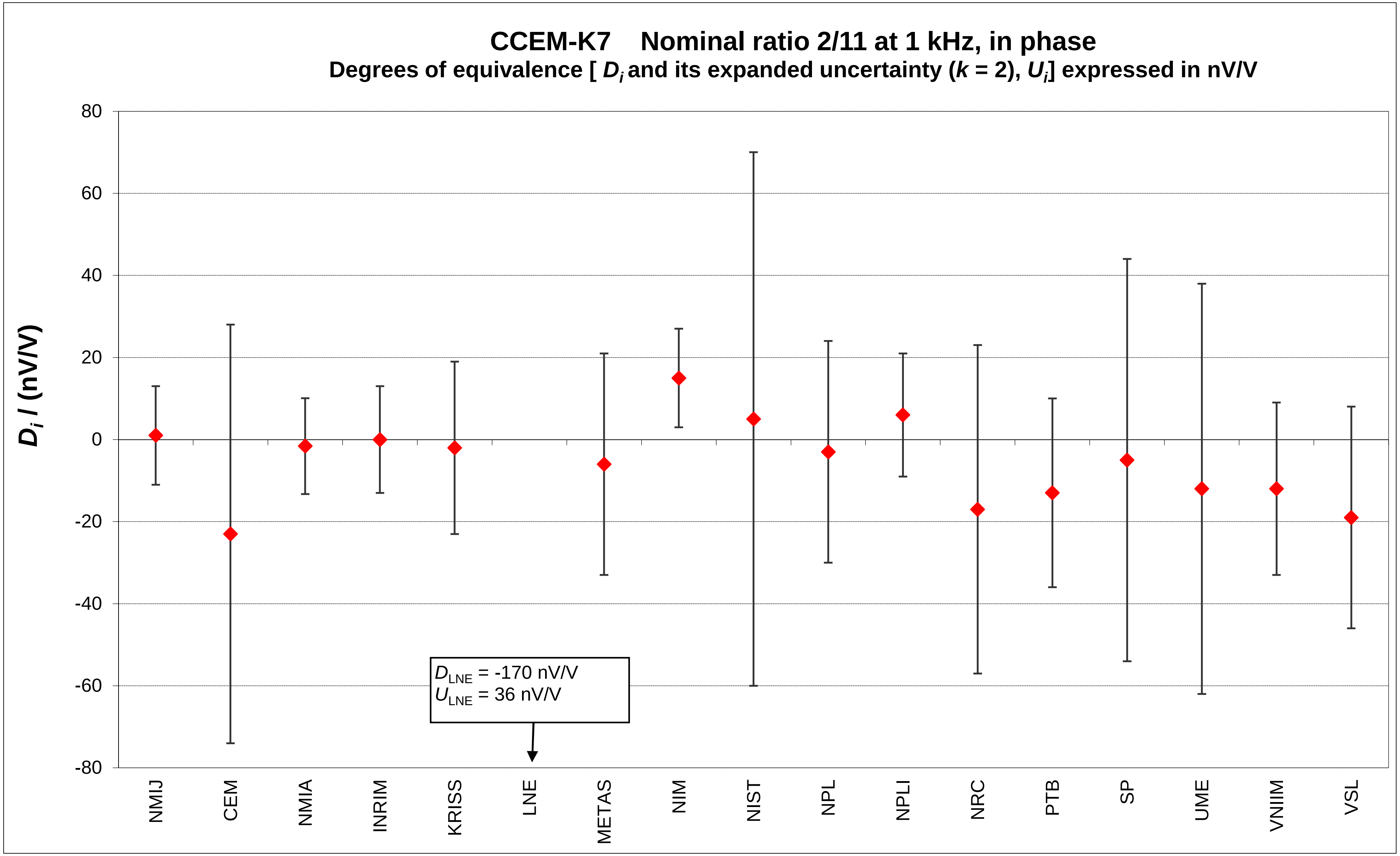

CCEM-K7 Nominal ratio 4/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
D_{LNE} = -132 nV/V
U_{LNE} = 41 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 4/11 at 1 kHz, quadrature
Degrees of equivalence [Di and its expanded uncertainty (k = 2), Ui] expressed in nV/V
Di / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
DLNE = 1000 nV/V
ULNE = 690 nV/V
DNPLI = -8323 nV/V
UNPLI = 500 nV/V
DVSL = -463 nV/V
UVSL = 210 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

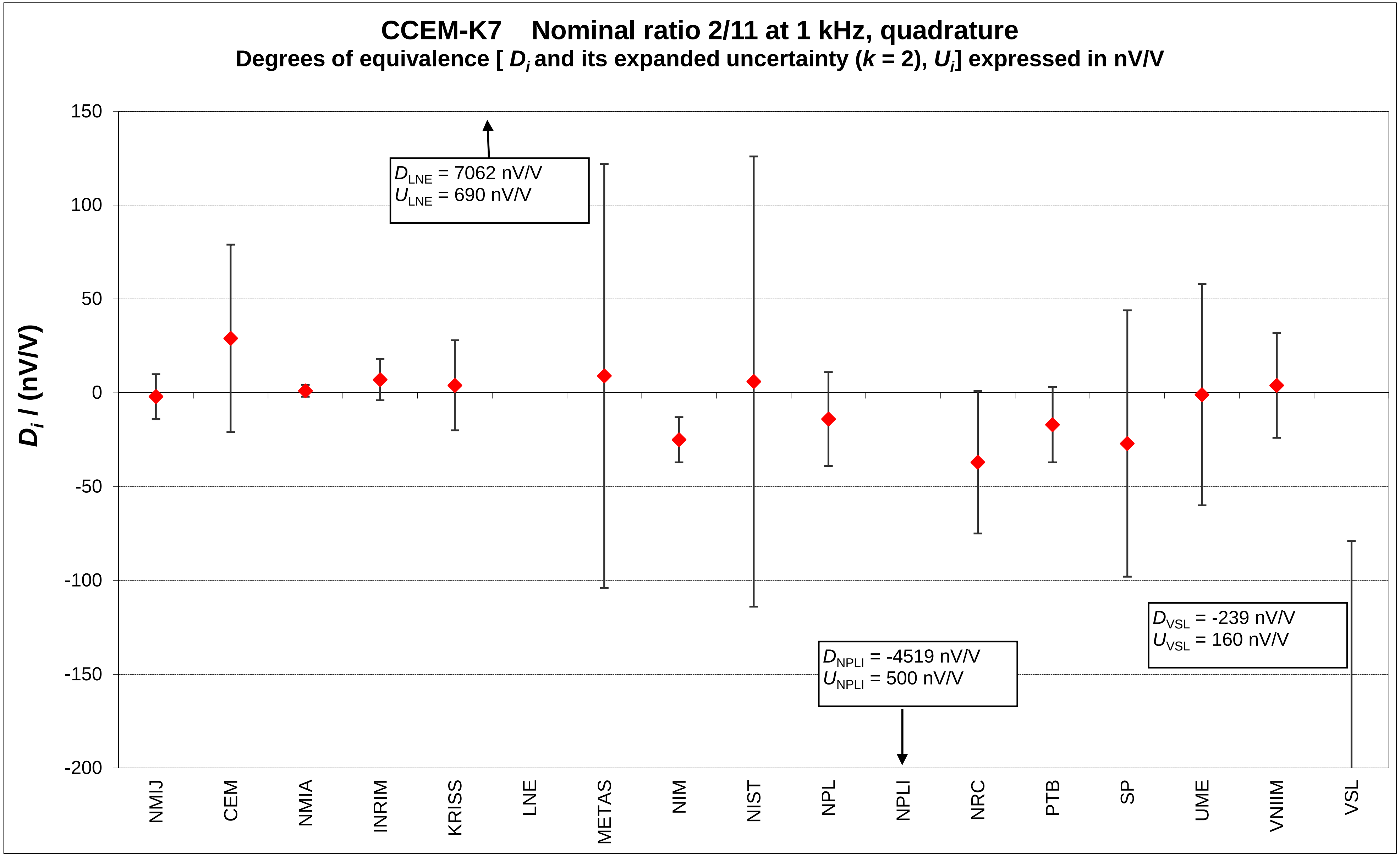

CCEM-K7 Nominal ratio 3/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
D_{LNE} = -238 nV/V
U_{LNE} = 39 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL

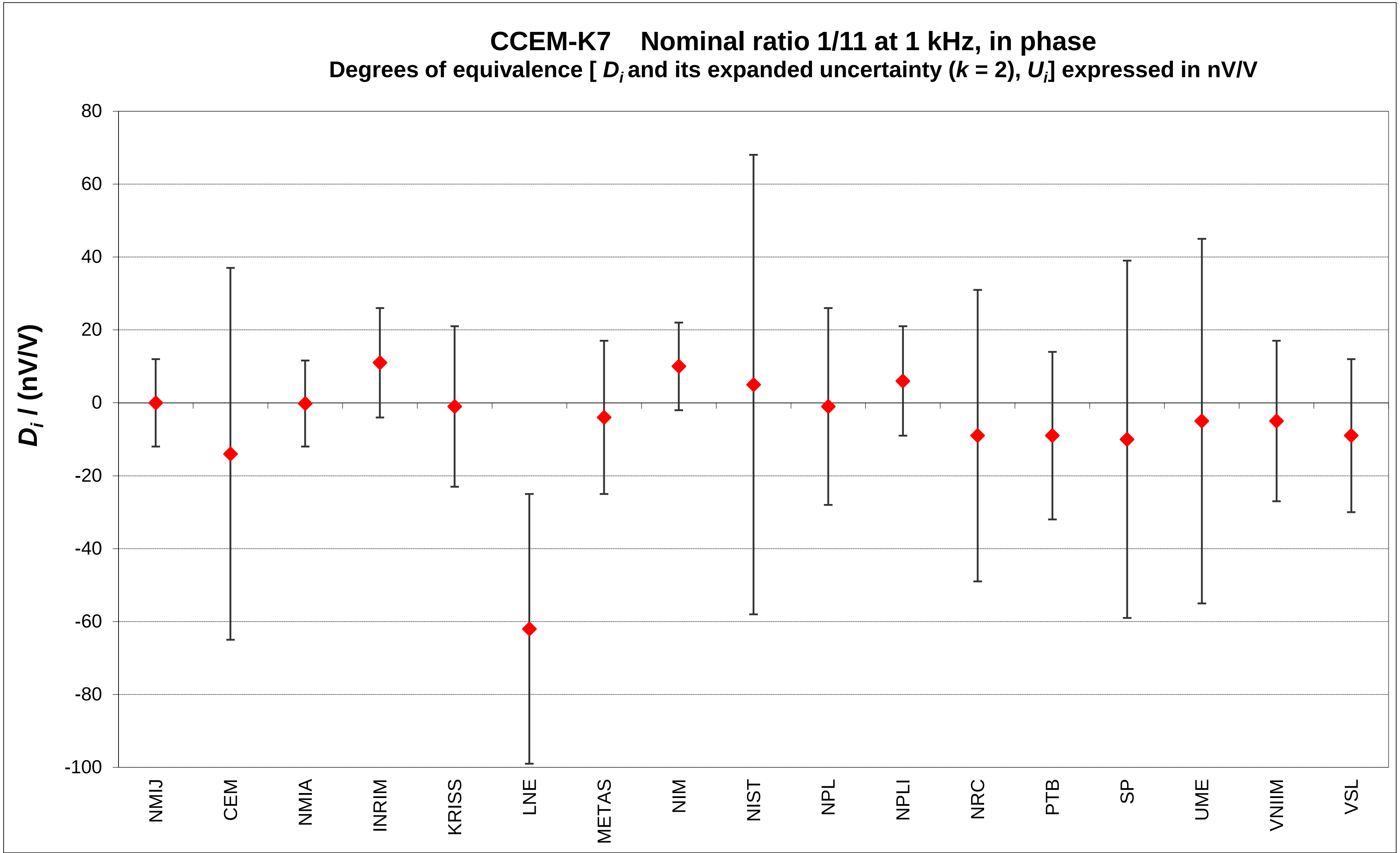


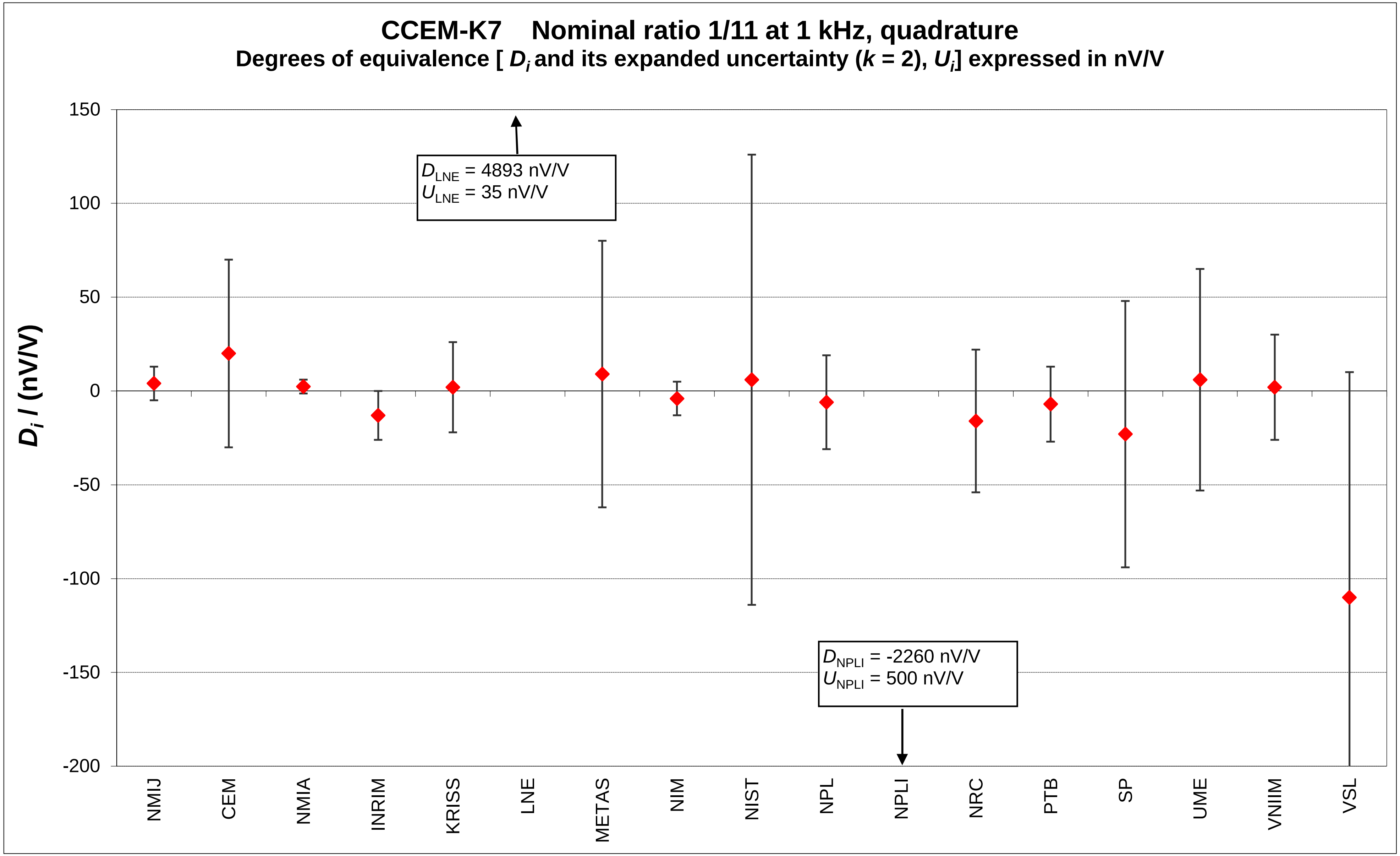
CCEM-K7 Nominal ratio 3/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
200
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 5338 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -6918 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -358 nV/V
U_{VSL} = 190 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



The BIPM key comparison database, June 2012


CCEM-K7 Nominal ratio 2/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
D_{LNE} = 7062 nV/V
U_{LNE} = 690 nV/V
D_{NPLI} = -4519 nV/V
U_{NPLI} = 500 nV/V
D_{VSL} = -239 nV/V
U_{VSL} = 160 nV/V
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL


CCEM-K7 Nominal ratio 1/11 at 1 kHz, in phase
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_i / (nV/V)
80
60
40
20
0
-20
-40
-60
-80
-100
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL



CCEM-K7 Nominal ratio 1/11 at 1 kHz, quadrature
Degrees of equivalence [D_i and its expanded uncertainty (k = 2), U_i] expressed in nV/V
D_{LNE} = 4893 nV/V
U_{LNE} = 35 nV/V
D_{NPLI} = -2260 nV/V
U_{NPLI} = 500 nV/V
D_i / (nV/V)
150
100
50
0
-50
-100
-150
-200
NMIJ
CEM
NMIA
INRIM
KRISS
LNE
METAS
NIM
NIST
NPL
NPLI
NRC
PTB
SP
UME
VNIIM
VSL