Key comparison CCL-K3   12-sided polygon

MEASURAND : Deviation from nominal angle between two faces of the polygon

x_i **:**   result of measurement carried out by laboratory i

u_i **:**   combined standard uncertainty of x_i

Face Lab i	1-2 x_i	2-3 x_i	3-4 x_i	4-5 x_i	5-6 x_i	6-7 x_i	7-8 x_i	8-9 x_i	9-10 x_i	10-11 x_i	11-12 x_i	12-1 x_i	u_i	Start date of measurement
						/ millisecond								
NMISA	-365	-95	397	249	-92	-625	-189	-58	337	390	-242	308	75	*
NIM	-389	-75	375	247	-75	-572	-202	-59	337	384	-214	244	73	21 Aug 2000
KRISS	-359	-59	337	245	-68	-559	-173	-59	309	361	-244	269	69	02 Oct 2000
NMIJ	-379	-58	371	226	-78	-571	-178	-42	345	350	-256	271	18	13 Nov 2000
PTB	-380	-60	380	230	-80	-580	-160	-50	320	360	-230	250	15	28 May 2001
METAS	-400	-60	400	220	-70	-570	-160	-50	310	360	-240	270	90	09 Jul 2001
LNE	-450	10	370	240	-110	-580	-190	20	260	400	-220	250	30	20 Aug 2001
INRIM	-380	-70	340	280	-90	-560	-210	-60	340	390	-170	180	16	01 Oct 2001
SMU	-395	-47	377	252	-94	-601	-189	-28	345	377	-239	265	60	15 Mar 2001
NIST	-386	-66	423	224	-74	-590	-179	-37	329	354	-227	256	20	28 Jan 2002
NRC	-380	-90	410	260	-70	-590	-200	-10	340	330	-250	250	75	11 Mar 2002
CENAM	-375	-84	346	227	-6	-589	-161	-64	295	343	-382	442	82	22 Apr 2002
VNIIM	-420	-30	390	260	-100	-620	-210	-10	370	390	-190	170	60	24 Jun 2002

* dates of measurements at the Pilot Laboratory: Jul 2000, 20 Jan 2001, 12 Dec 2001, 03 Jun 2002, and Aug 2002

Key comparison CCL-K3   **12-sided polygon**

MEASURAND : Deviation from nominal angle between two faces of the polygon

For each face-to-face reading, the key comparison reference value, x_R, is calculated as the weighted mean of all participants' results. Its standard uncertainty, u_R, is calculated as the standard deviation of the weighted mean.

	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1
x_R	-386	-58	375	243	-83	-576	-183	-43	328	368	-220	238
u_R	7.8											

x_R and u_R are expressed in milliseconds

For each face-to-face reading, the degree of equivalence of laboratory *i* with respect to the key comparison reference value is given by a pair of terms, both expressed in milliseconds:

$D_i = (x_i - x_R)$ **and its expanded uncertainty** $U_i = 2(u_i^2 - u_R^2)^{1/2}$.

The degree of equivalence between pair of laboratories have not been computed for this key comparison.

Key comparison CCL-K3   12-sided polygon

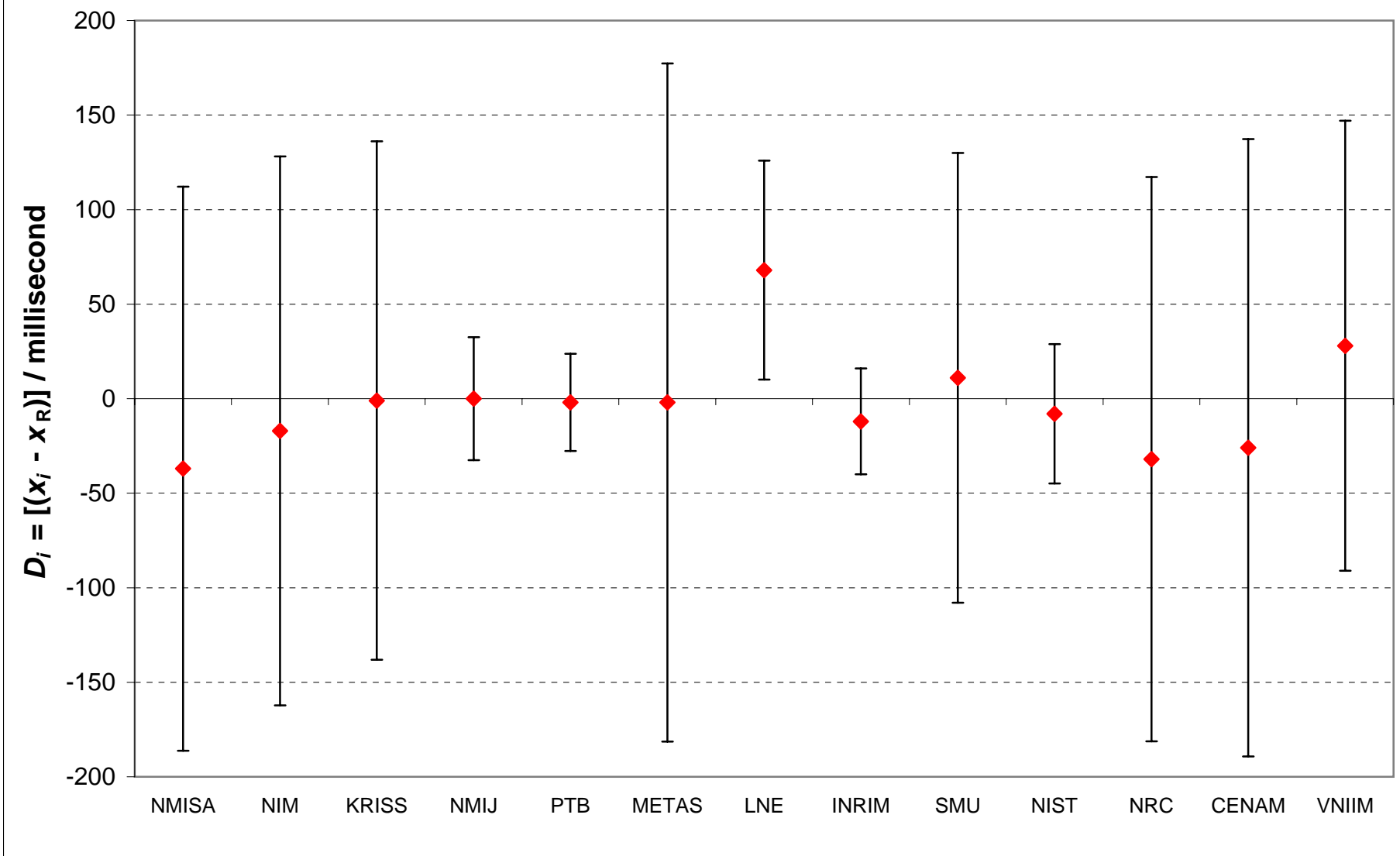**MEASURAND : Deviation from nominal angle between two faces of the polygon**

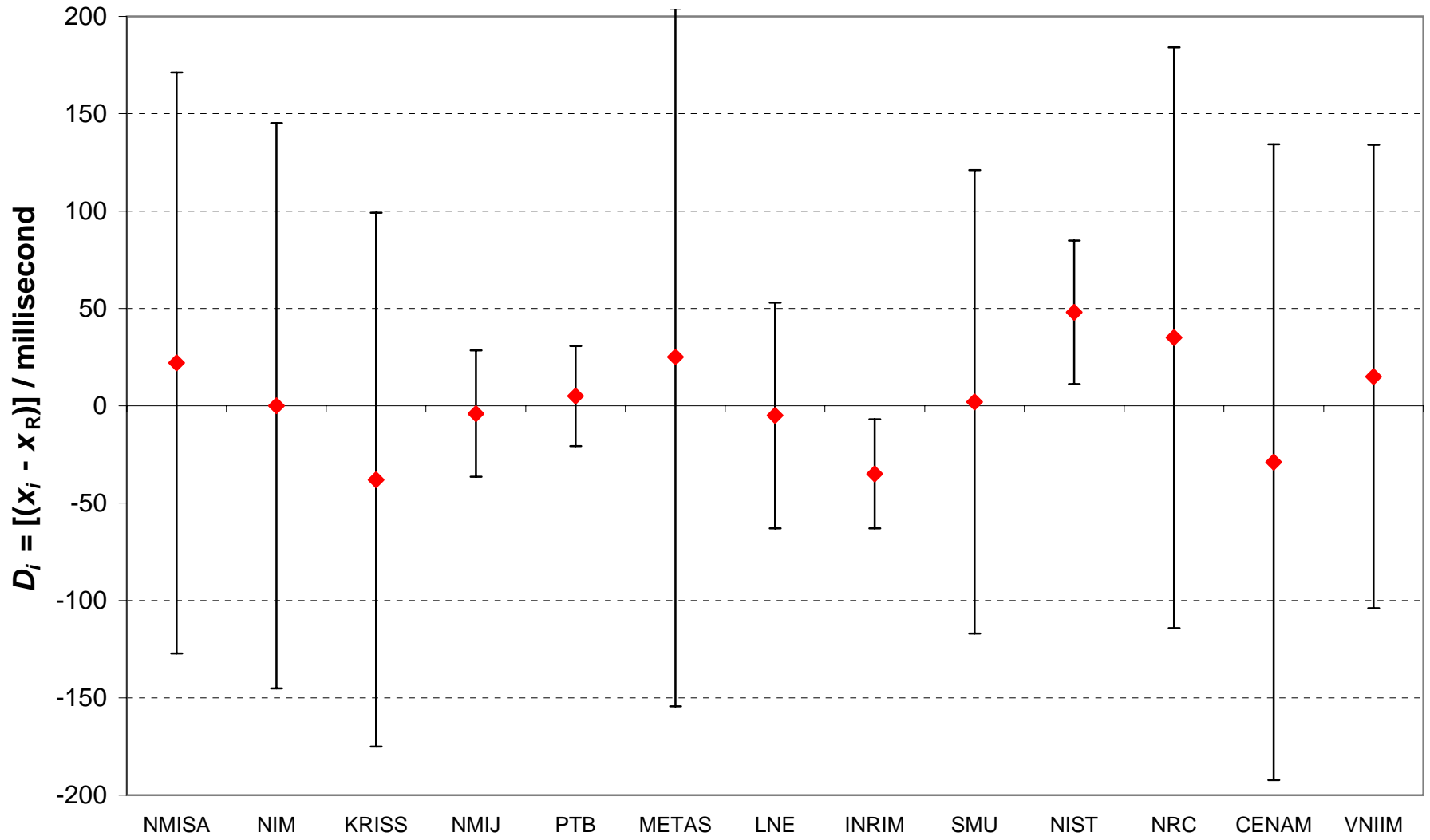| Face	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	
Lab i ⇓							D_i / millisecond						U_i
NMISA	21	-37	22	6	-9	-49	-6	-15	9	22	-22	70	149
NIM	-3	-17	0	4	8	4	-19	-16	9	16	6	6	145
KRISS	27	-1	-38	2	15	17	10	-16	-19	-7	-24	31	137
NMIJ	7	0	-4	-17	5	5	5	1	17	-18	-36	33	32
PTB	6	-2	5	-13	3	-4	23	-7	-8	-8	-10	12	26
METAS	-14	-2	25	-23	13	6	23	-7	-18	-8	-20	32	179
LNE	-64	68	-5	-3	-27	-4	-7	63	-68	32	0	12	58
INRIM	6	-12	-35	37	-7	16	-27	-17	12	22	50	-58	28
SMU	-9	11	2	9	-11	-25	-6	15	17	9	-19	27	119
NIST	0	-8	48	-19	9	-14	4	6	1	-14	-7	18	37
NRC	6	-32	35	17	13	-14	-17	33	12	-38	-30	12	149
CENAM	11	-26	-29	-16	77	-13	22	-21	-33	-25	-162	204	163
VNIIM	-34	28	15	17	-17	-44	-27	33	42	22	30	-68	119

D_i and U_i are expressed in milliseconds

CCL-K3, Polygon, Deviation from nominal angle between faces 1 and 2

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds
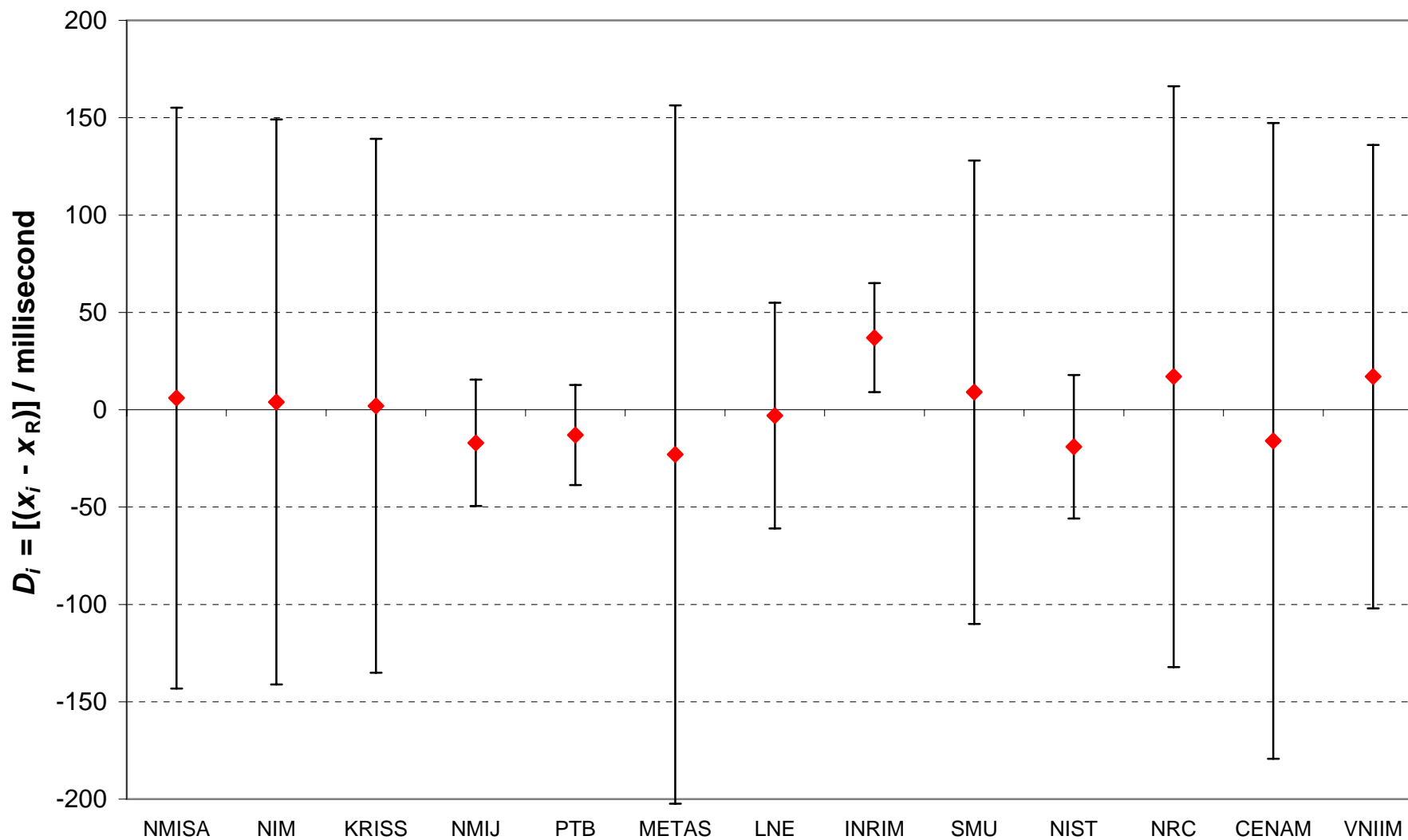
$D_i = [(x_i - x_R)]$ / millisecond
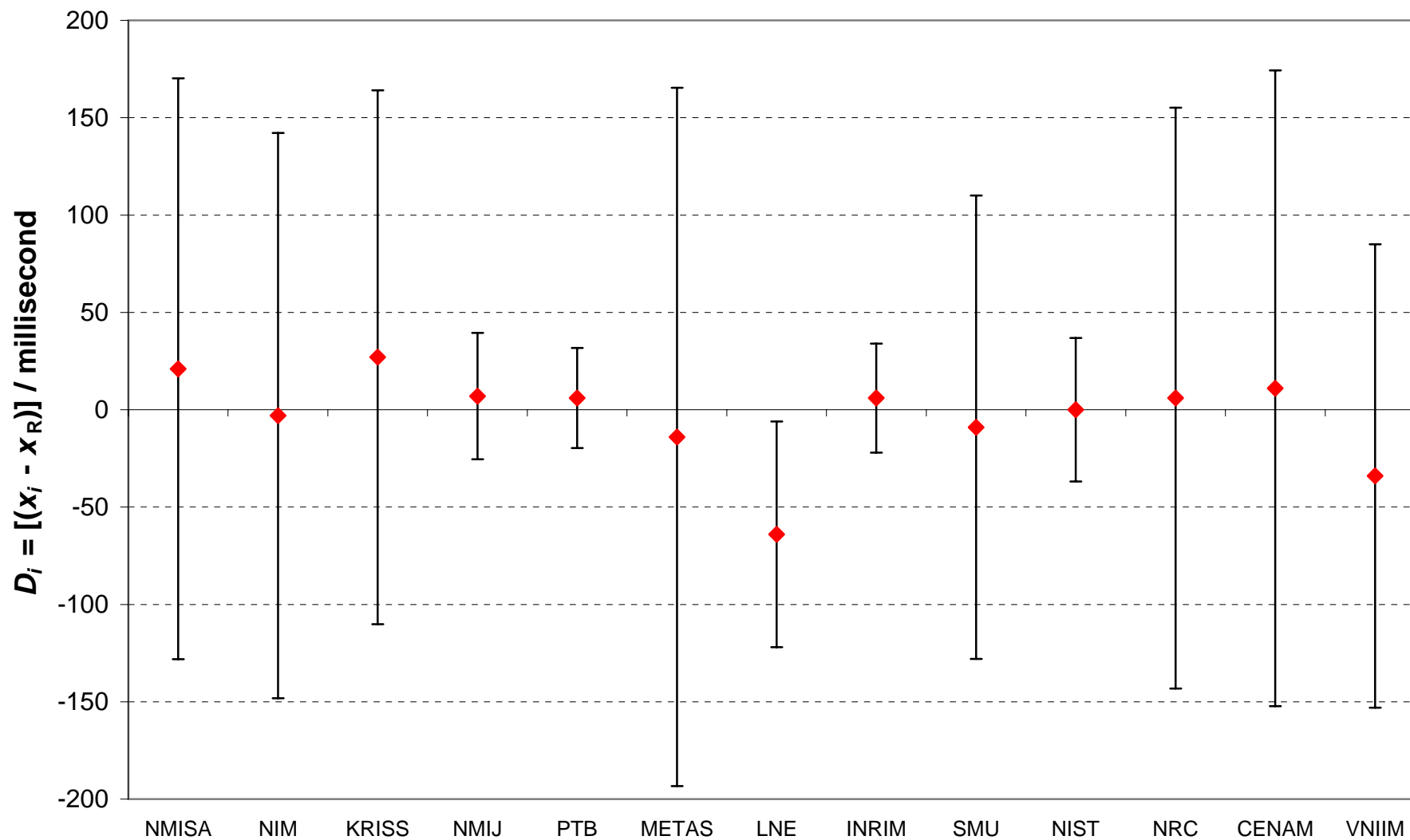
CCL-K3, Polygon, Deviation from nominal angle between faces 2 and 3

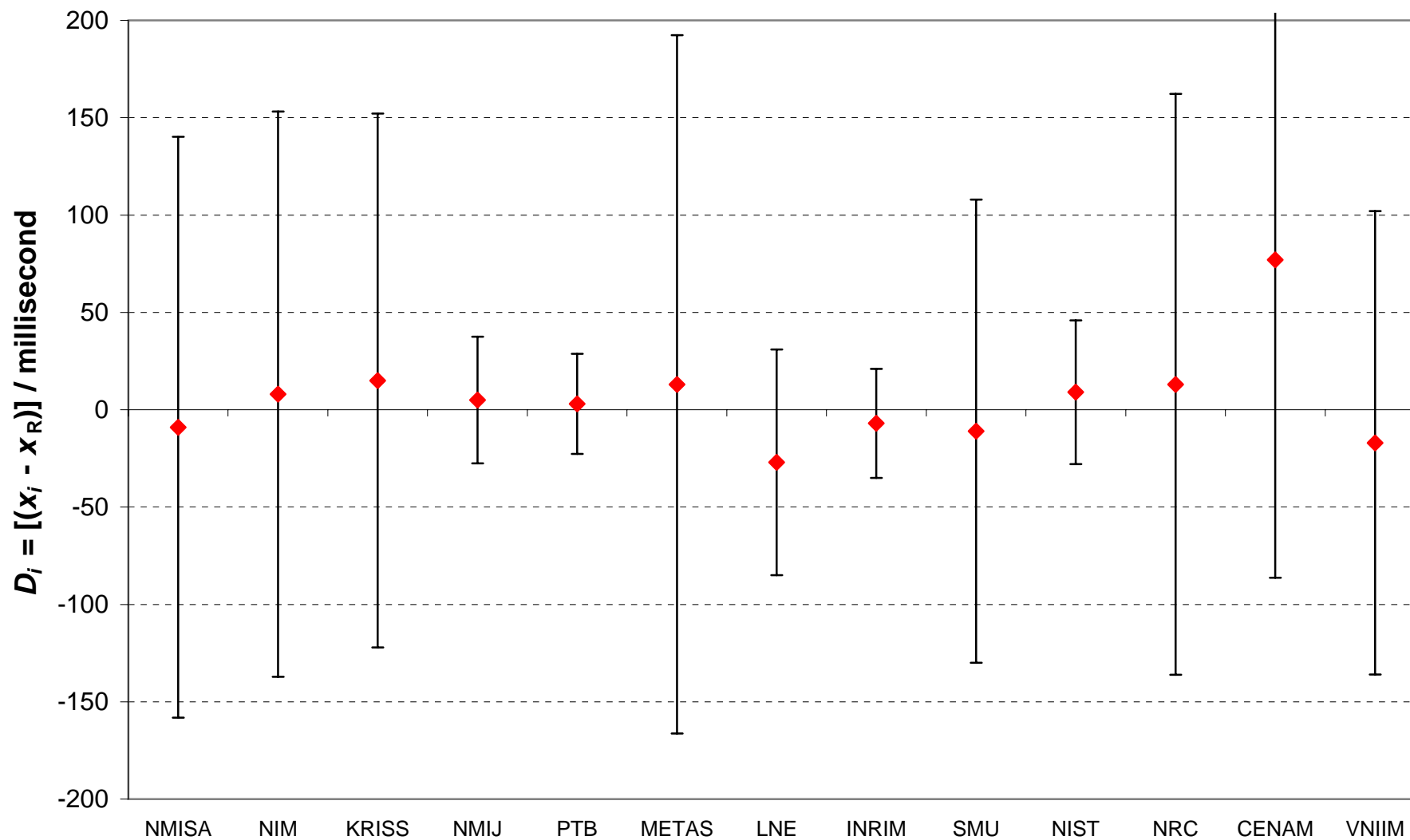Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)] / $ millisecond

CCL-K3, Polygon, Deviation from nominal angle between faces 3 and 4

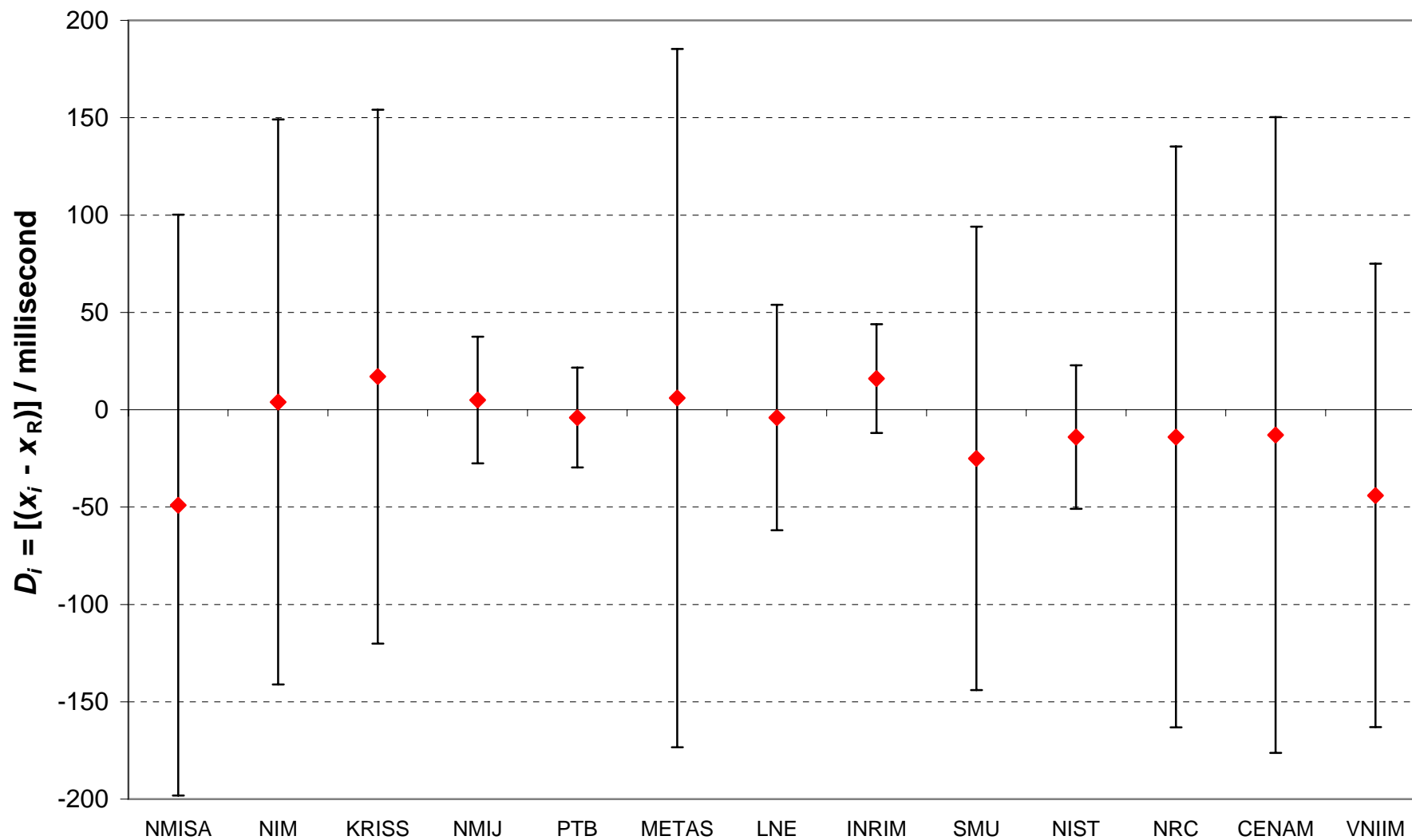Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

Y-axis: $D_i = [(x_i - x_R)]$ / millisecond

X-axis categories: NMISA, NIM, KRISS, NMIJ, PTB, METAS, LNE, INRIM, SMU, NIST, NRC, CENAM, VNIIM

CCL-K3, Polygon, Deviation from nominal angle between faces 4 and 5

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)] $ / millisecond

NMISA   NIM   KRISS   NMIJ   PTB   METAS   LNE   INRIM   SMU   NIST   NRC   CENAM   VNIIM
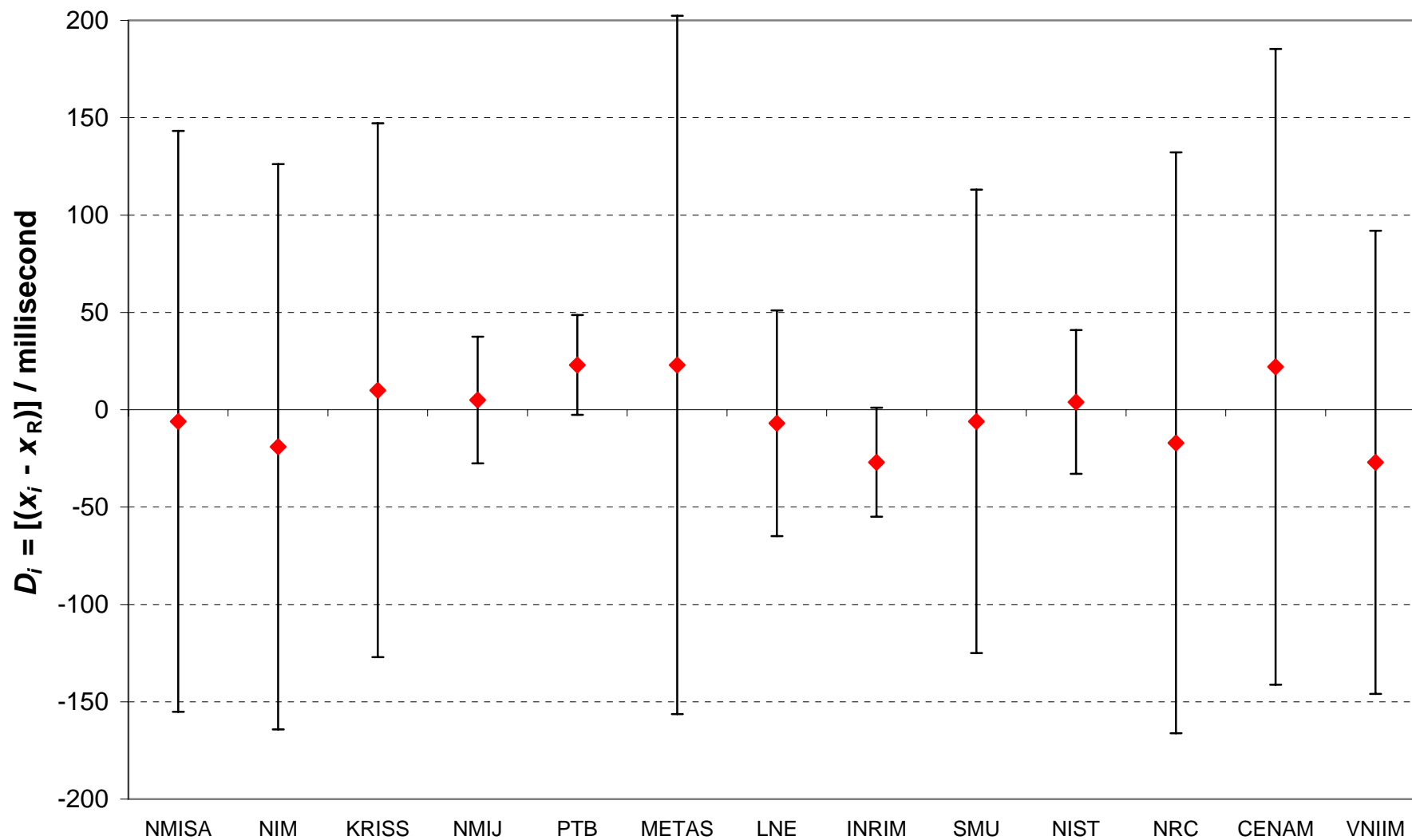
CCL-K3, Polygon, Deviation from nominal angle between faces 5 and 6

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

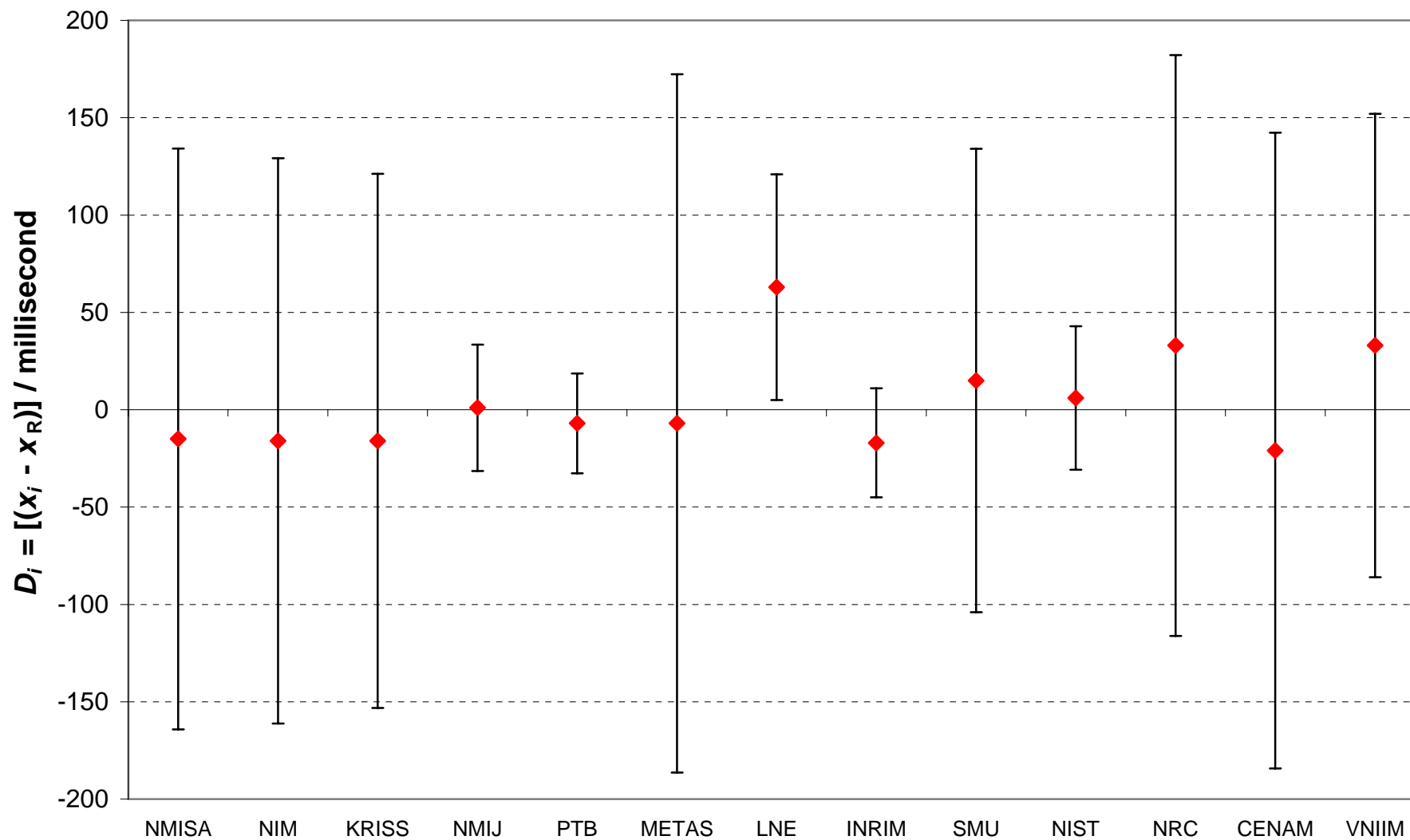$D_i = [(x_i - x_R)] / \text{millisecond}$

CCL-K3, Polygon, Deviation from nominal angle between faces 6 and 7

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

CCL-K3, Polygon, Deviation from nominal angle between faces 7 and 8

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

CCL-K3, Polygon, Deviation from nominal angle between faces 8 and 9

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds
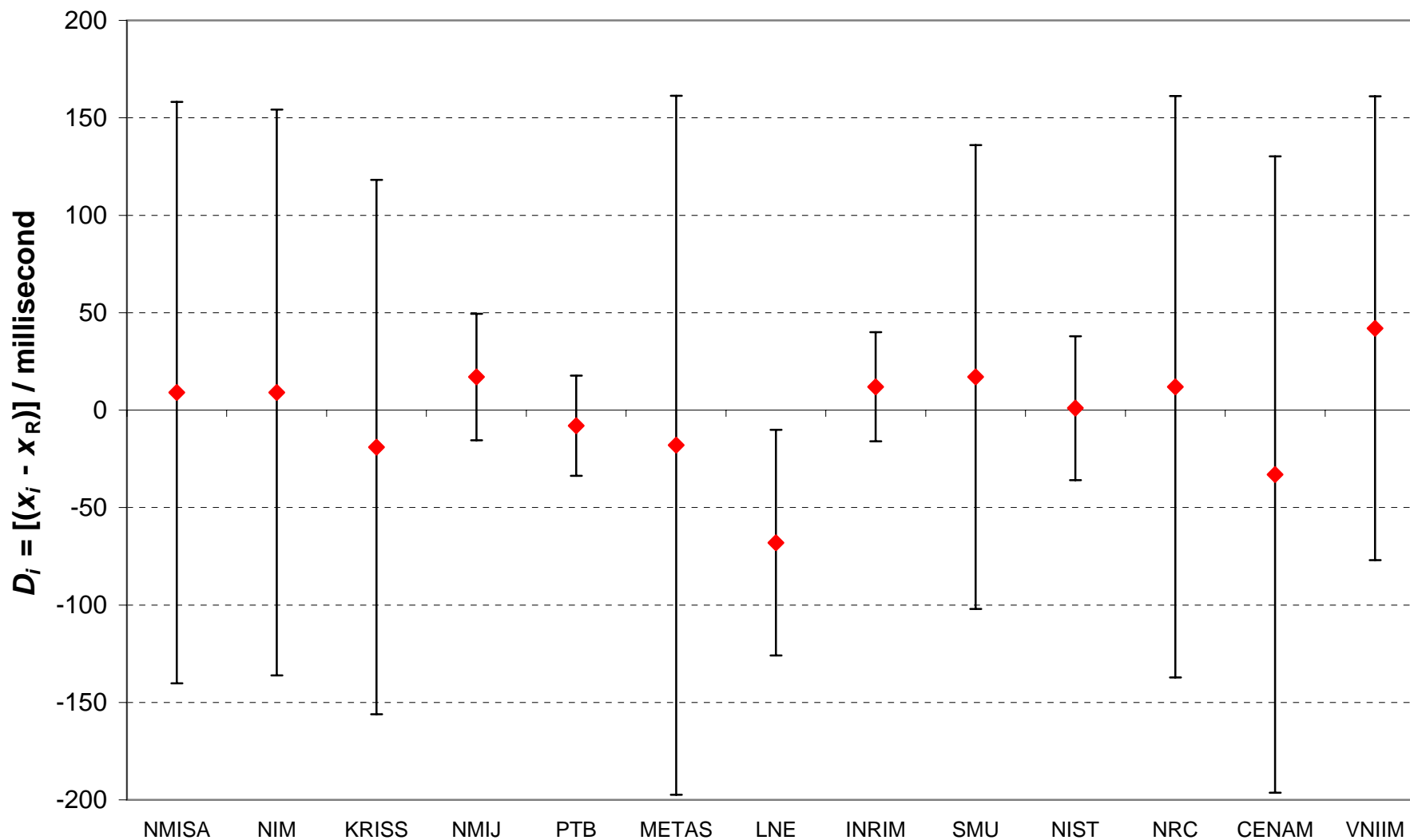
CCL-K3, Polygon, Deviation from nominal angle between faces 9 and 10

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

NMISA   NIM   KRISS   NMIJ   PTB   METAS   LNE   INRIM   SMU   NIST   NRC   CENAM   VNIIM
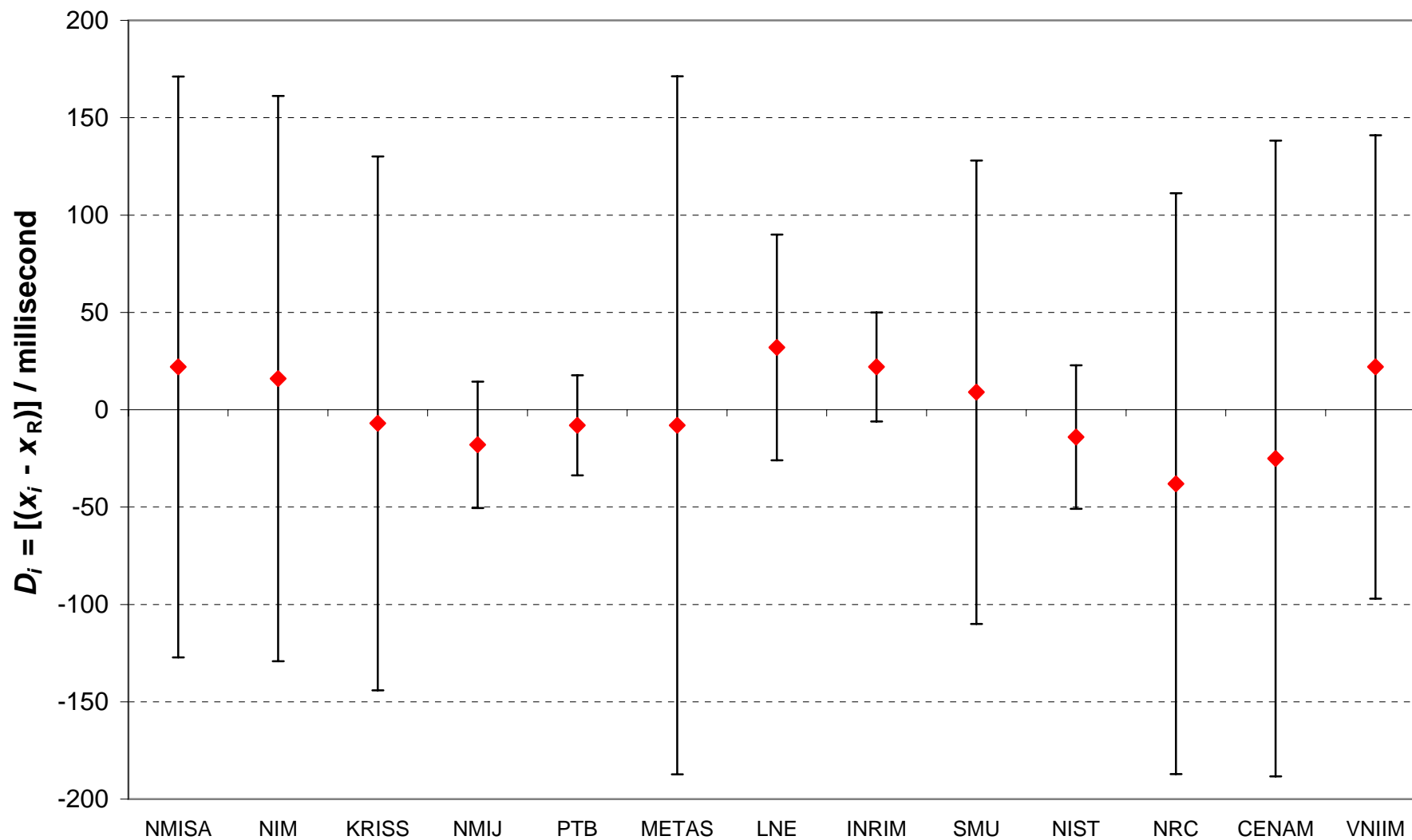
CCL-K3, Polygon, Deviation from nominal angle between faces 10 and 11

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

NMISA NIM KRISS NMIJ PTB METAS LNE INRIM SMU NIST NRC CENAM VNIIM

CCL-K3, Polygon, Deviation from nominal angle between faces 11 and 12

Degrees of equivalence D_i and expanded uncertainty (k = 2) U_i, expressed in milliseconds

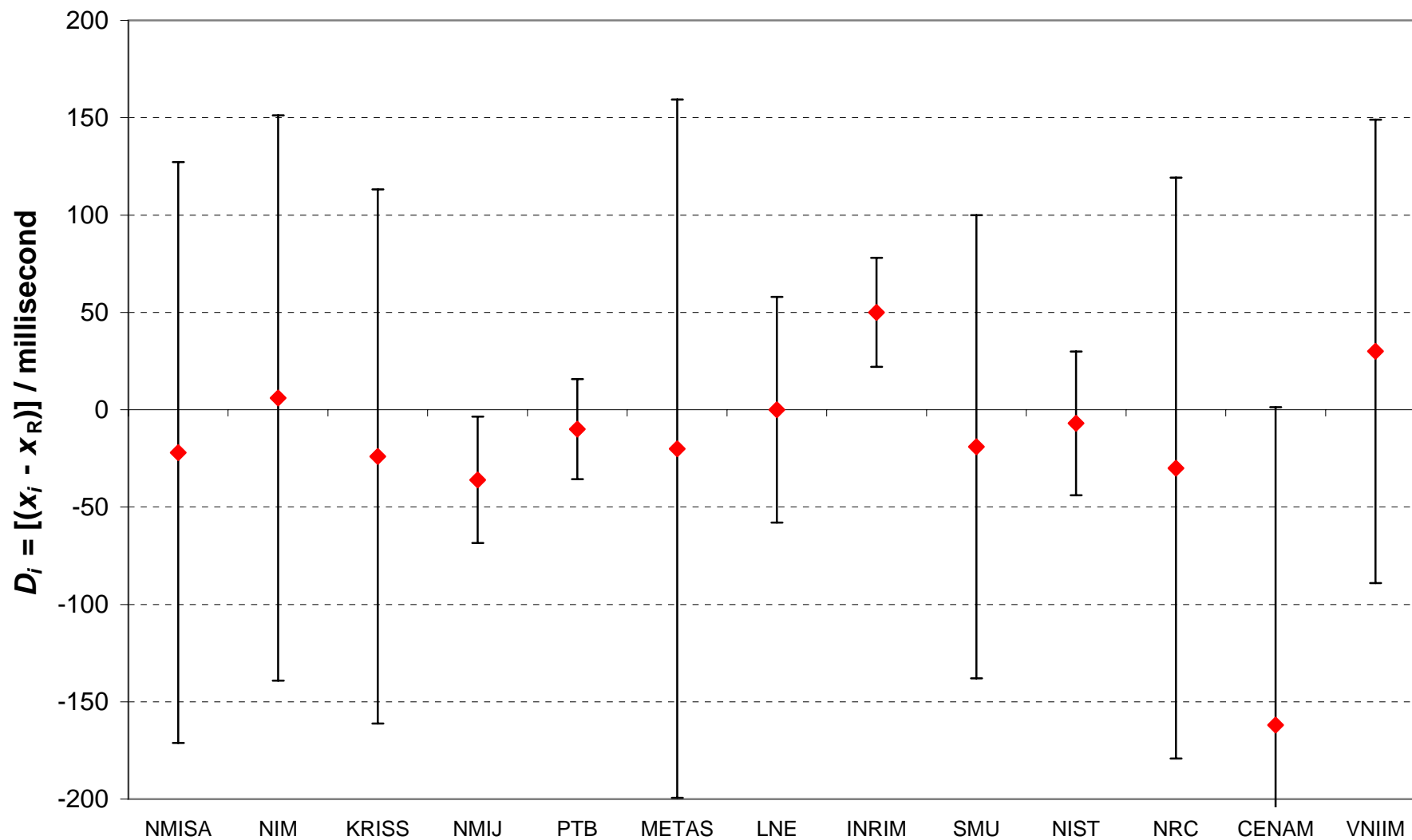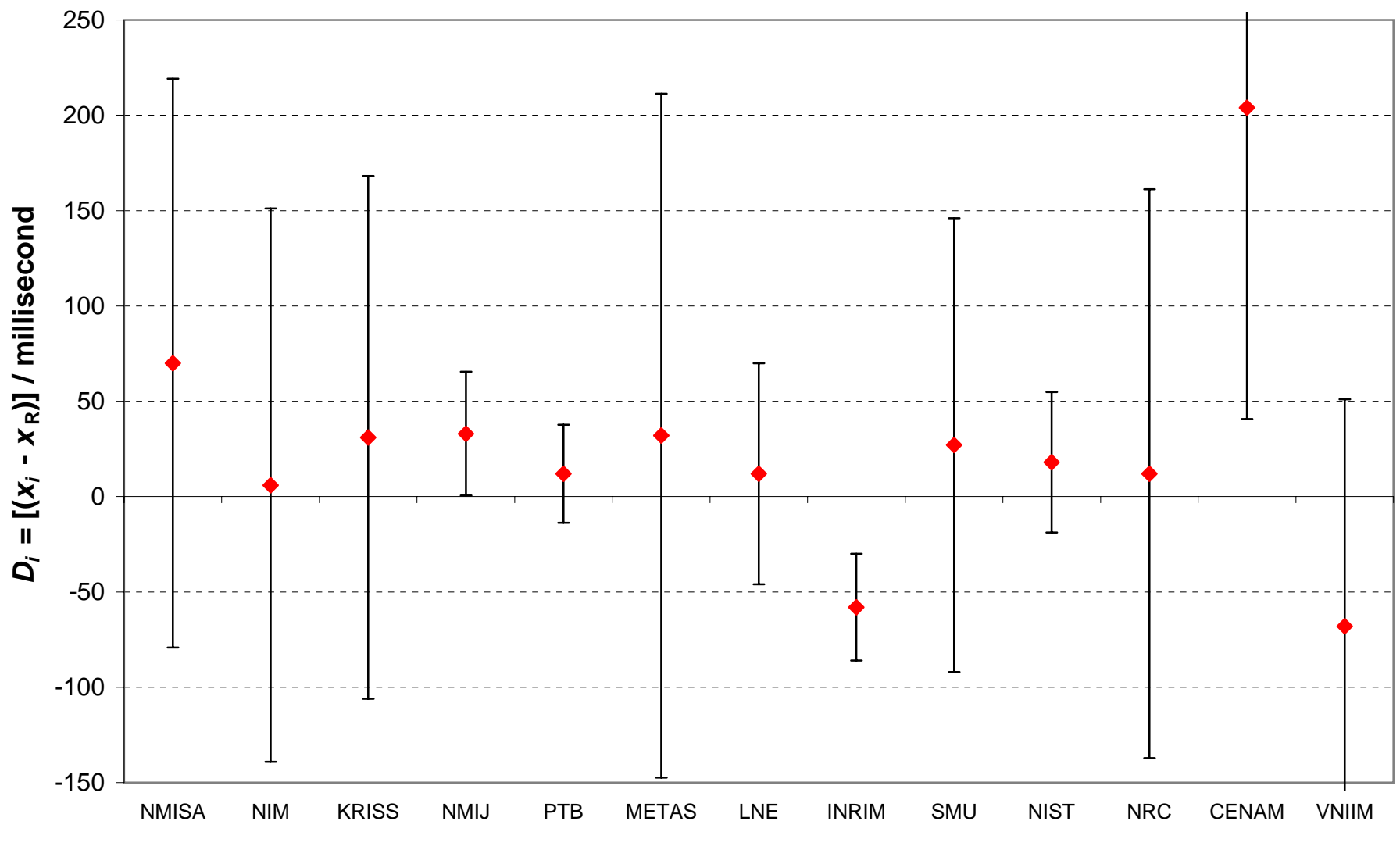**CCL-K3, Polygon, Deviation from nominal angle between faces 12 and 1**

Degrees of equivalence D_i and expanded uncertainty (k = 2) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

NMISA, NIM, KRISS, NMIJ, PTB, METAS, LNE, INRIM, SMU, NIST, NRC, CENAM, VNIIM

Key comparison CCL-K3   Angle blocks

MEASURAND : Deviation from nominal angles 5", 5', 30', and 5°

x_i **:**   result of measurement carried out by laboratory i

u_i **:**   combined standard uncertainty of x_i

Lab i	5"		5'		30'		5°		Start date of measurement
	x_i / millisecond	u_i	x_i / millisecond	u_i	x_i / millisecond	u_i	x_i / millisecond	u_i	
NMISA	-90	100	190	110	600	100	370	100	*
NIM	-70	57	10	57	530	64	250	64	21 Aug 2000
KRISS	-85	82	62	82	520	82	287	82	02 Oct 2000
NMIJ	-70	145	410	692	-210	360	150	624	13 Nov 2000
PTB	-30	50	60	50	560	50	360	50	28 May 2001
METAS	10	70	30	70	560	80	340	70	09 Jul 2001
LNE	-20	50	-30	50	60	50	250	50	20 Aug 2001
INRIM	60	55	-930	105	530	55	280	68	01 Oct 2001
SMU	-30	60	10	60	540	60	280	60	15 Mar 2001
NIST	-29	23	10	23	561	23	274	23	28 Jan 2002
NRC	-10	75	10	100	590	75	340	75	11 Mar 2002
CENAM	30	105	-	-	510	105	300	105	22 Apr 2002
VNIIM	100	60	520	60	620	60	170	60	24 Jun 2002

* dates of measurements at the Pilot Laboratory: Jul 2000, 20 Jan 2001, 12 Dec 2001, 03 Jun 2002, and Aug 2002

Key comparison CCL-K3 Angle blocks

MEASURAND : Deviation from nominal angles 5", 5', 30', and 5°

For each angle block, the key comparison reference value, x_R, is calculated as the weighted mean of all participants' results. Its standard uncertainty, u_R, is calculated as the standard deviation of the weighted mean.

	5"
x_R	-11
u_R	14.7

	5'
x_R	64
u_R	16.2

	30'
x_R	538
u_R	15.6

	5°
x_R	278
u_R	15.0

x_R and u_R are expressed in milliseconds

For each angle block, the degree of equivalence of laboratory *i* with respect to the key comparison reference value is given by a pair of terms, both expressed in milliseconds:
$D_i = (x_i - x_R)$ and its expanded uncertainty $U_i = 2(u_i^2 - u_R^2)^{1/2}$.

The degree of equivalence between pair of laboratories have not been computed for this key comparison.

Key comparison CCL-K3 Angle blocks

Nominal angle 5"

Lab i ⇓	D_i / millisecond	U_i
NMISA	-79	198
NIM	-59	110
KRISS	-74	161
NMIJ	-59	289
PTB	-19	96
METAS	21	137
LNE	-9	96
INRIM	71	106
SMU	-19	116
NIST	-18	35
NRC	1	147
CENAM	41	208
VNIIM	111	116

Nominal angle 5'

Lab i ⇓	D_i / millisecond	U_i
NMISA	126	218
NIM	-54	109
KRISS	-2	161
NMIJ	346	1384
PTB	-4	95
METAS	-34	136
LNE	-94	95
INRIM	-994	207
SMU	-54	116
NIST	-54	33
NRC	-54	197
CENAM	-	-
VNIIM	456	116

Nominal angle 30'

Lab i ⇓	D_i / millisecond	U_i
NMISA	62	198
NIM	-8	124
KRISS	-18	161
NMIJ	-748	719
PTB	22	95
METAS	22	157
LNE	-478	95
INRIM	-8	105
SMU	2	116
NIST	23	34
NRC	52	147
CENAM	-28	208
VNIIM	82	116

Nominal angle 5°

Lab i ⇓	D_i / millisecond	U_i
NMISA	92	198
NIM	-28	124
KRISS	9	161
NMIJ	-128	1248
PTB	82	95
METAS	62	137
LNE	-28	95
INRIM	2	133
SMU	2	116
NIST	-4	35
NRC	62	147
CENAM	22	208
VNIIM	-108	116

CCL-K3, Angle block, Deviation from nominal angle 5"

Degrees of equivalence D_i and expanded uncertainty (k = 2) U_i, expressed in milliseconds

CCL-K3, Angle block, Deviation from nominal angle 5'

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

NMISA NIM KRISS NMIJ PTB METAS LNE INRIM SMU NIST NRC CENAM VNIIM
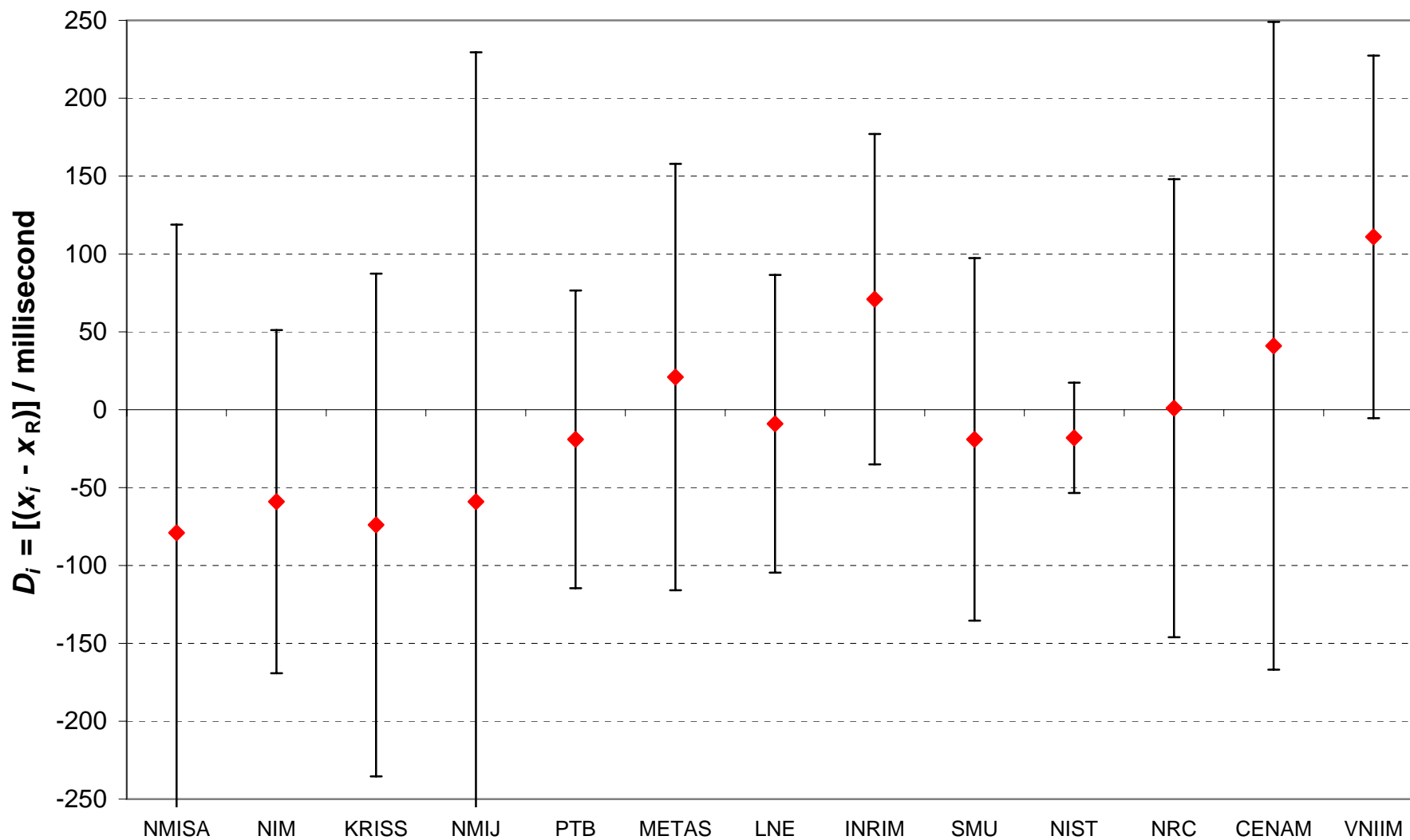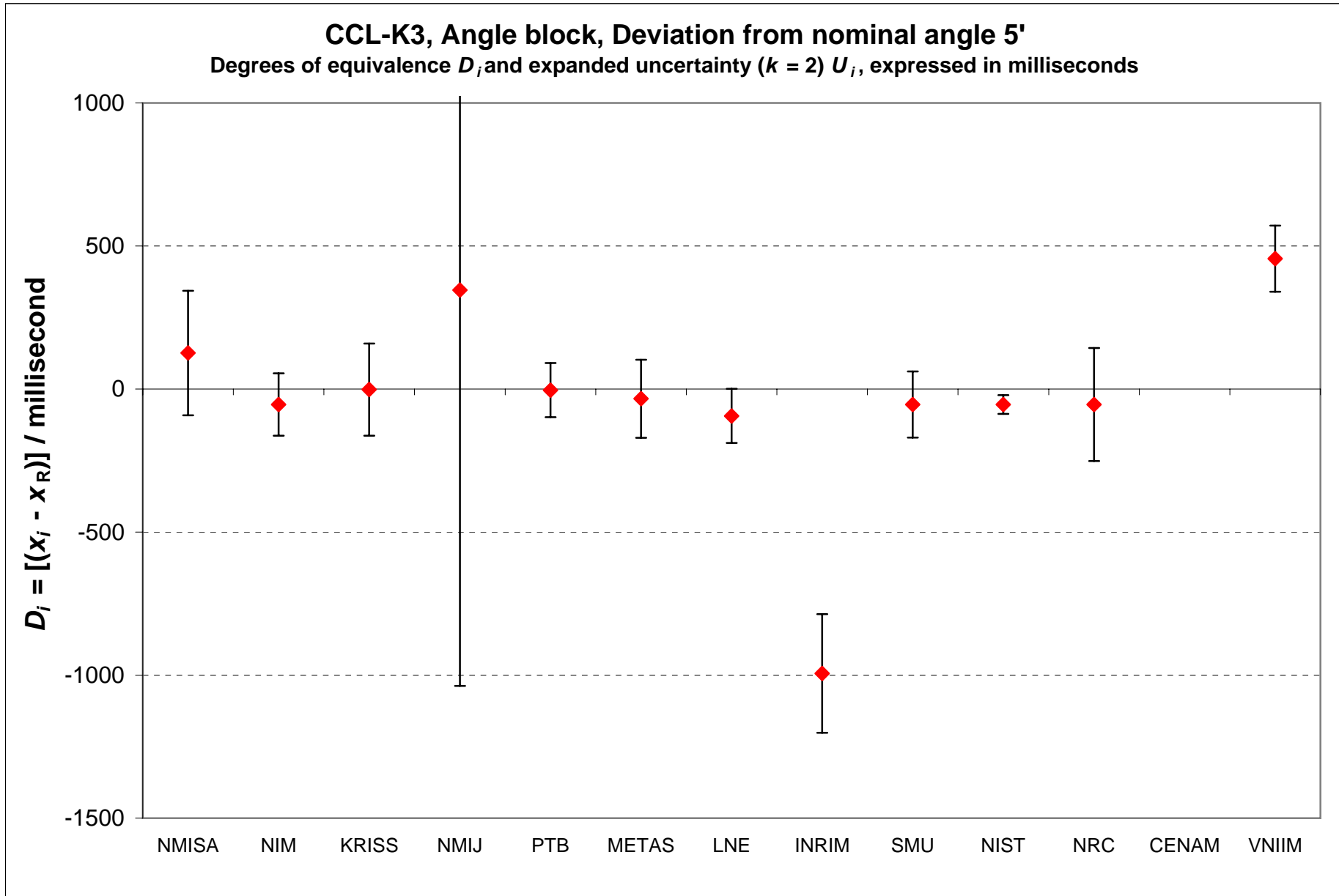
CCL-K3, Angle block, Deviation from nominal angle 30'
Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds

$D_i = [(x_i - x_R)]$ / millisecond

NMISA, NIM, KRISS, NMIJ, PTB, METAS, LNE, INRIM, SMU, NIST, NRC, CENAM, VNIIM

CCL-K3, Angle block, Deviation from nominal angle 5°

Degrees of equivalence D_i and expanded uncertainty ($k = 2$) U_i, expressed in milliseconds