

**Key comparison CCEM-K4.2017**

**MEASURAND :** Capacitance

**NOMINAL VALUE :** 10 pF

*The individual measurement results are presented in Section 10 of the CCEM-K4.2017 Final Report.*

**The key comparison reference value  $KCRV_{10pF}$  was calculated as the weighted mean of the relative differences  $\Delta_i$  from the nominal capacitor value of the laboratories Lab  $i$ .**

**$KCRV_{10pF} = -0.010 \times 10^{-6}$  with an associated weighted uncertainty of  $u_{10pF} = 0.011 \times 10^{-6}$ .**

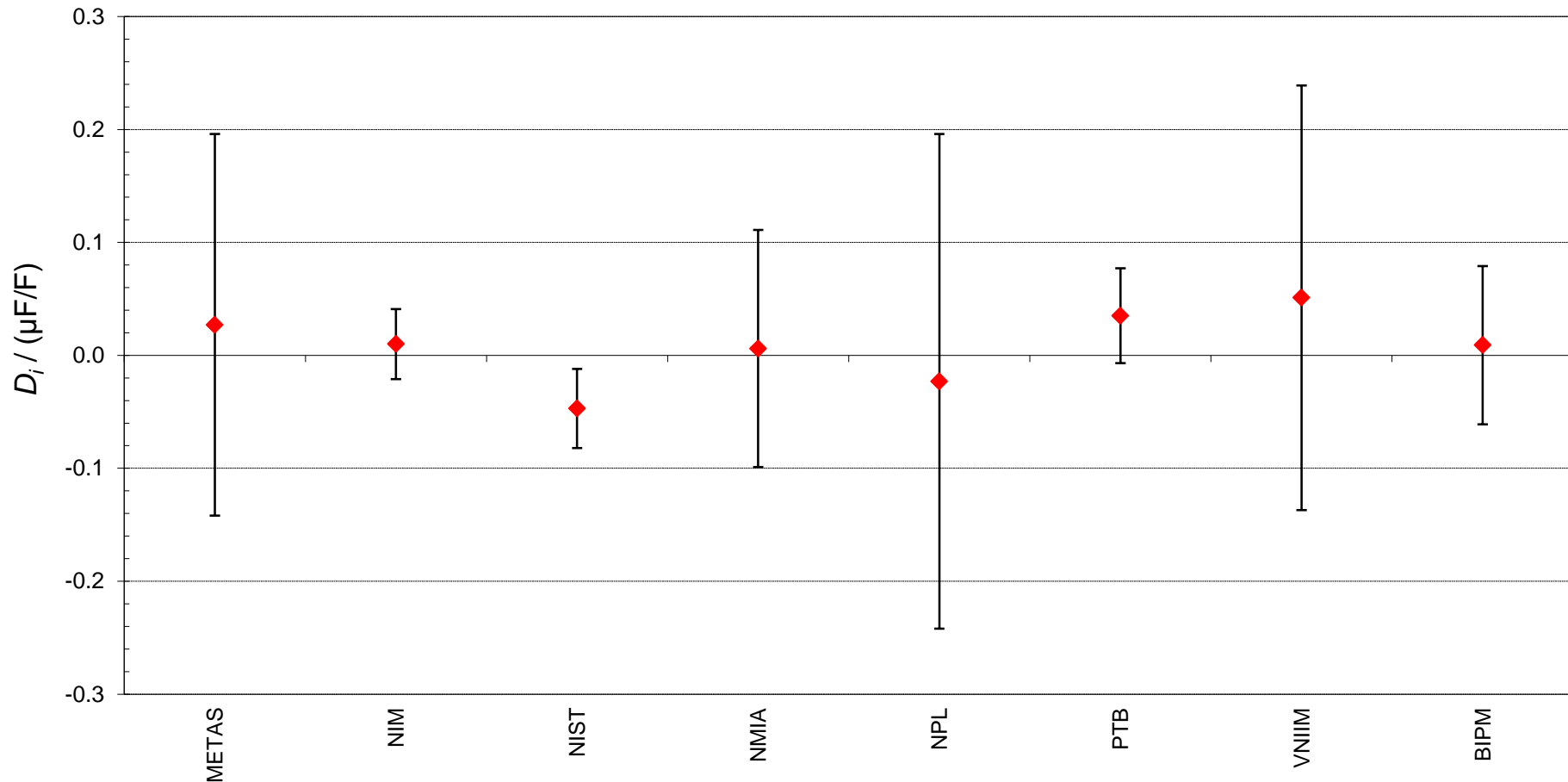
**The degree of equivalence of laboratory  $i$  with respect to the reference value is given by a pair of terms, both expressed in  $\mu F/F$ :  $D_i = (\Delta_i - KCRV_{10pF})$  and its expanded uncertainty  $U_i$  ( $k = 2$ ) where  $U_i = 2 (u^2(\Delta_i) - u_{10pF}^2)^{1/2}$**

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	$D_i$	$U_i$
	/ ( $\mu F/F$ )	
<b>METAS</b>	<b>0.027</b>	0.169
<b>NIM</b>	<b>0.010</b>	0.031
<b>NIST</b>	<b>-0.047</b>	0.035
<b>NMIA</b>	<b>0.006</b>	0.105
<b>NPL</b>	<b>-0.023</b>	0.219
<b>PTB</b>	<b>0.035</b>	0.042
<b>VNIIM</b>	<b>0.051</b>	0.188
<b>BIPM</b>	<b>0.009</b>	0.070

# CCEM-K4.2017

## Degrees of equivalence for capacitance at 10 pF



Key comparison CCEM-K4.2017

MEASURAND : Capacitance

NOMINAL VALUE : 100 pF

*The individual measurement results are presented in Section 10 of the CCEM-K4.2017 Final Report.*

The key comparison reference value  $KCRV_{100\text{pF}}$  was calculated as the weighted mean of the relative differences  $\Delta_i$  from the nominal capacitor value of the laboratories Lab  $i$ .

$KCRV_{100\text{pF}} = -0.033 \times 10^{-6}$  with an associated weighted uncertainty of  $u_{100\text{pF}} = 0.011 \times 10^{-6}$ .

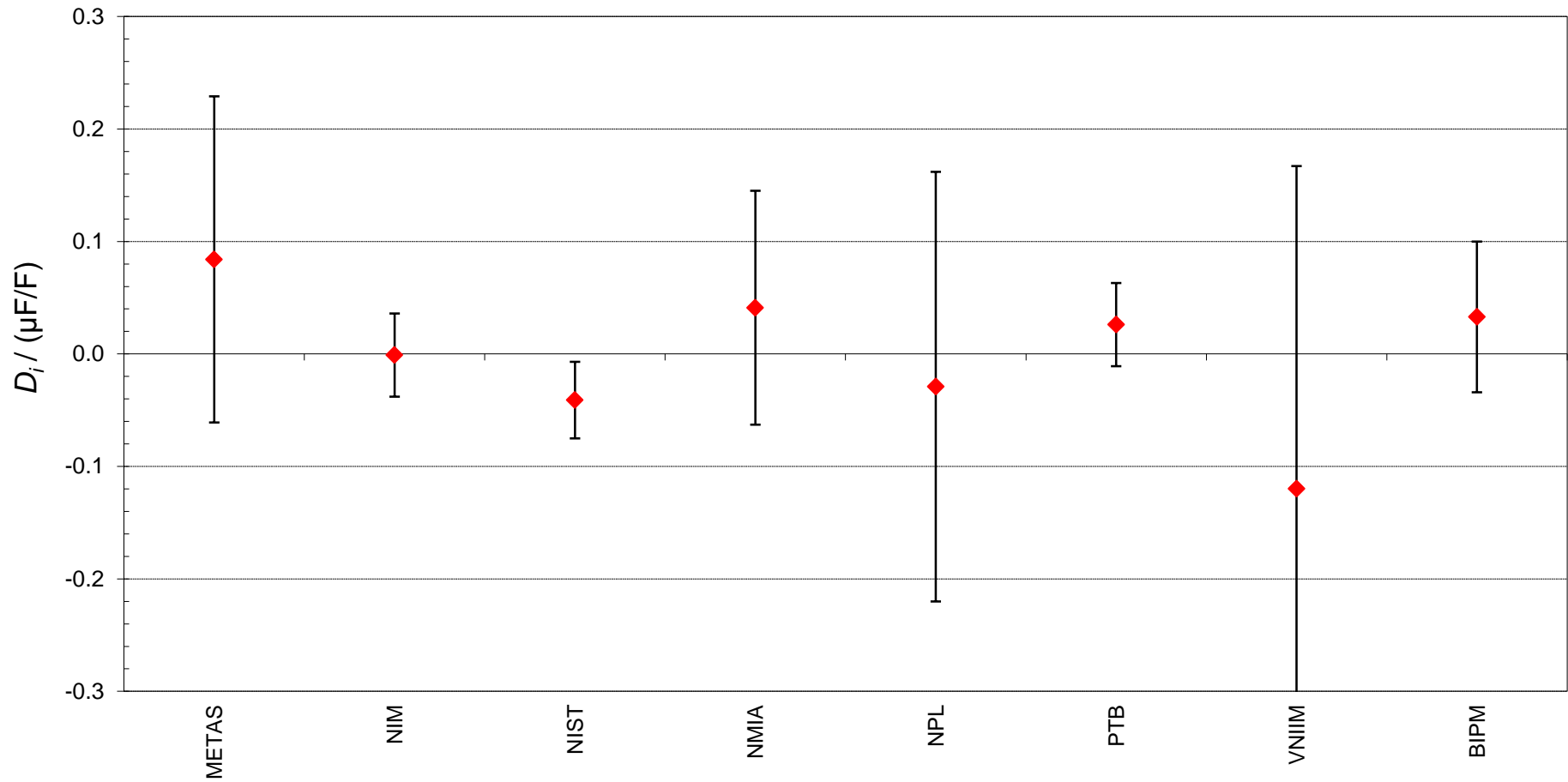
The degree of equivalence of laboratory  $i$  with respect to the reference value is given by a pair of terms, both expressed in  $\mu\text{F}/\text{F}$ :  $D_i = (\Delta_i - KCRV_{100\text{pF}})$  and its expanded uncertainty  $U_i$  ( $k = 2$ ) where  $U_i = 2 (u^2(\Delta_i) - u_{100\text{pF}}^2)^{1/2}$

↓

	$D_i$	$U_i$
	/ ( $\mu\text{F}/\text{F}$ )	
METAS	0.084	0.145
NIM	-0.001	0.037
NIST	-0.041	0.034
NMIA	0.041	0.104
NPL	-0.029	0.191
PTB	0.026	0.037
VNIIM	-0.120	0.287
BIPM	0.033	0.067

### CCEM-K4.2017

Degrees of equivalence for capacitance at 100 pF



Key comparison CCEM-K4.2017

MEASURAND : Capacitance ratio

NOMINAL VALUE : 100 pF : 10 pF

The individual measurement results are presented in Section 13 of the CCEM-K4.2017 Final Report.

The key comparison reference value  $KCRV_{10:1}$  was calculated as the weighted mean of the difference  $\varepsilon_i$  between the capacity ratio of Lab  $i$  and the BIPM.

$KCRV_{10:1} = -0.016 \times 10^{-6}$  with an associated weighted uncertainty of  $u_{10:1} = 0.008 \times 10^{-6}$ .

The degree of equivalence of laboratory  $i$  with respect to the reference value is given by a pair of terms, both expressed in  $\mu F/F$ :  $D_i = (\varepsilon_i - KCRV_{10:1})$  and its expanded uncertainty  $U_i$  ( $k = 2$ ) where  $U_i = 2 (u^2(\varepsilon_i) - u_{10:1}^2)^{1/2}$

↓

	$D_i$	$U_i$
	/ ( $\mu F/F$ )	
METAS	0.050	0.095
NIM	-0.018	0.047
NIST	-0.001	0.027
NMIA	0.029	0.036
NPL	-0.013	0.150
PTB	-0.015	0.025
VNIIM	-0.178	0.244
BIPM	0.016	0.058

# CCEM-K4.2017

Degrees of equivalence for capacitance ratio of 100 pF:10 pF

