

Mass and Related Quantities

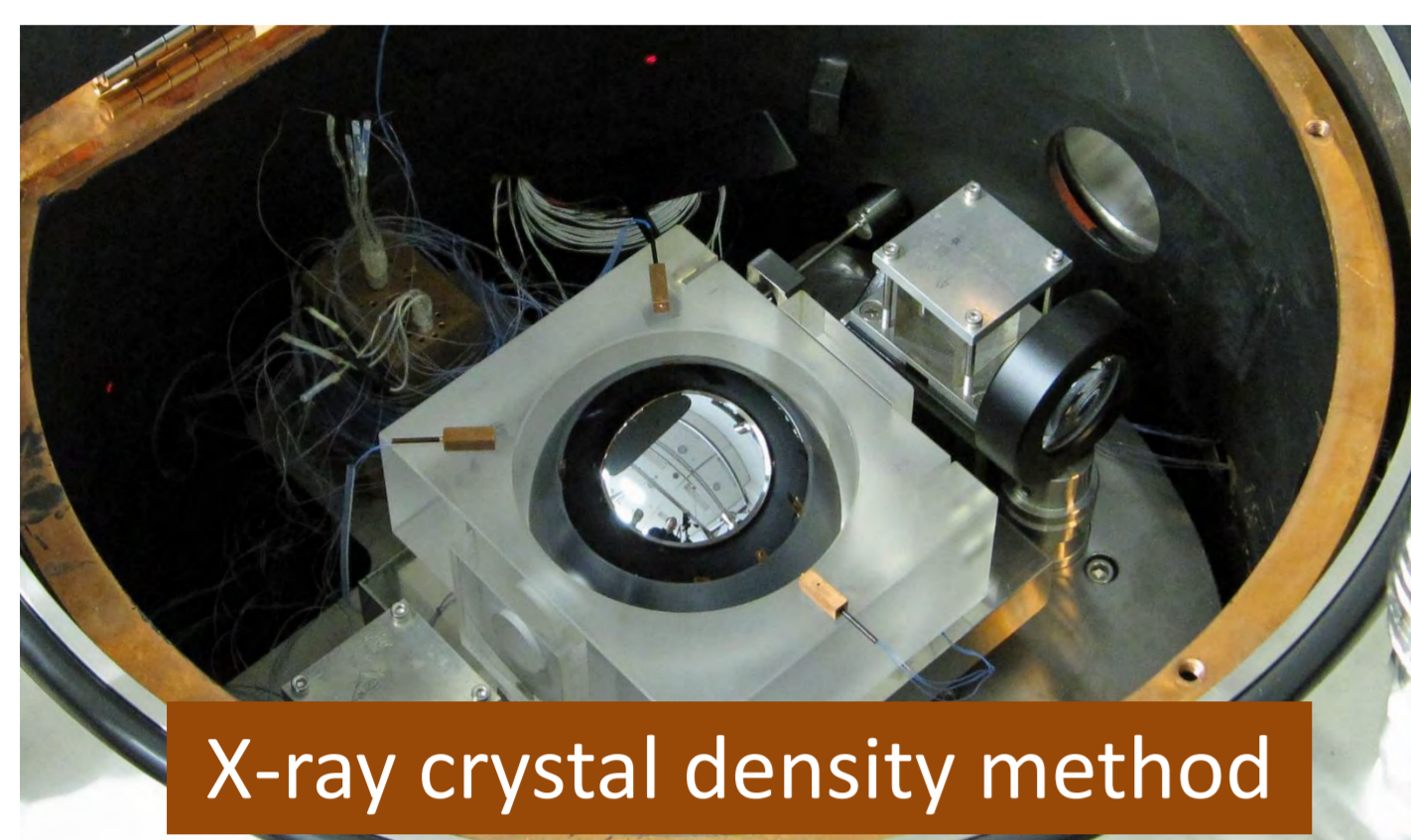
The Consultative Committee for Mass and Related Quantities (CCM)

force, torque, density, viscosity, fluid flow, gravimetry, pressure, vacuum, hardness

Dissemination of the kilogram following redefinition



Kibble (watt) balance



X-ray crystal density method

$$h = 6.626\ 070\ 15 \times 10^{-34} \text{ J s}$$

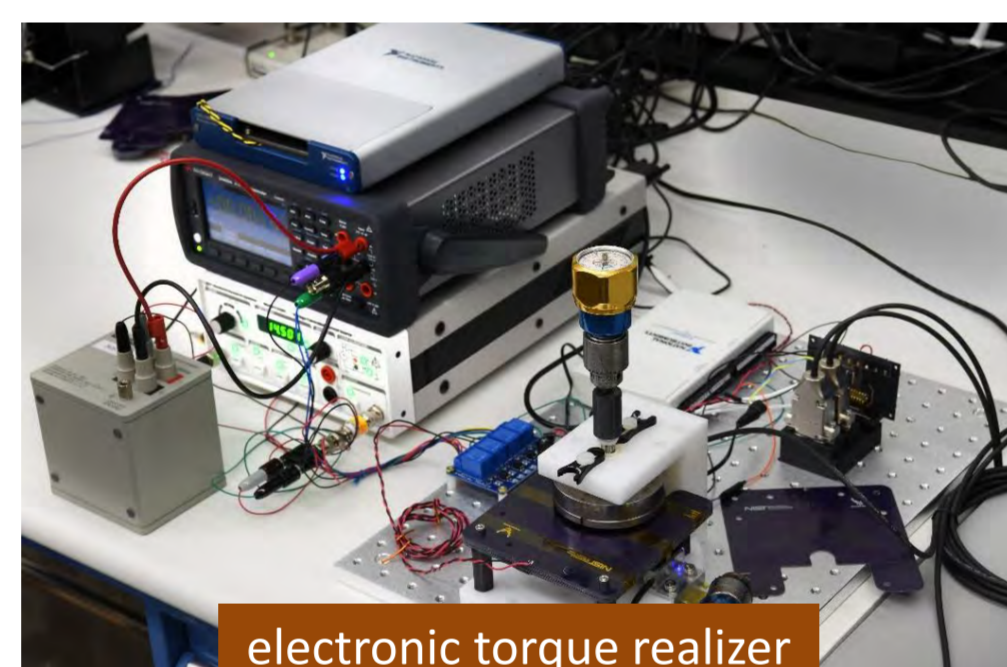
- *mise-en-pratique* published in May 2019 and regularly updated
- CCM detailed note on the dissemination process
 - an internationally coordinated dissemination from realization experiments using a Consensus Value
 - dissemination of the first Consensus Value from 1 February 2021, adjustments to the CMCs of 31 NMIs on the KCDB
 - dissemination of the second Consensus Value from early 2023

Global forum for progressing the state of the art

- workshop on the new activities and developments in mass and related quantities during the CCM meeting in May 2019
- workshop “ion gauge” organized by the WG on Pressure and Vacuum in May 2020
- Two workshops on gravimetry organized by BKG Germany and LNE SYRTE France in cooperation with IAG Working Group in 2022



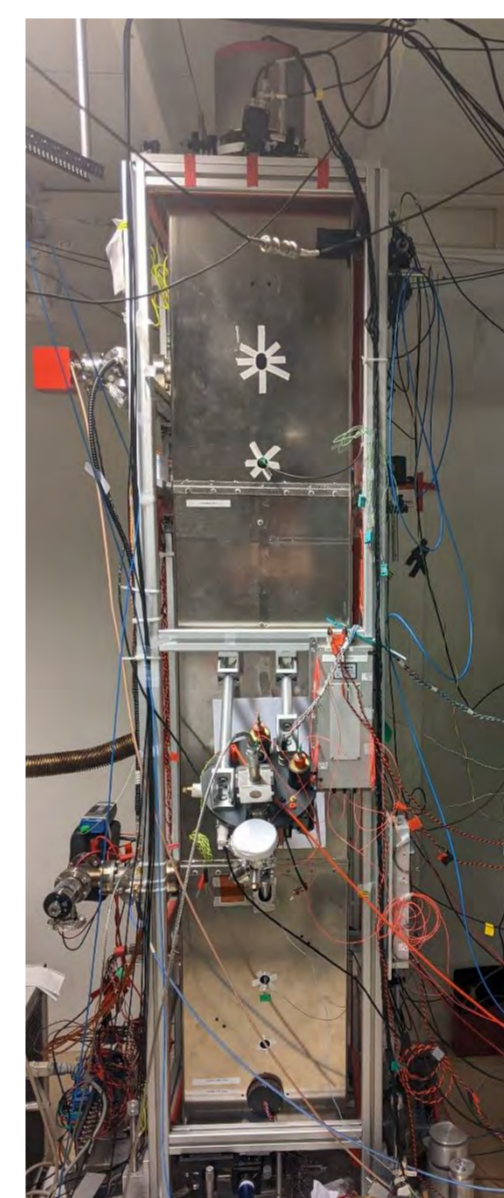
micro-Kibble balance



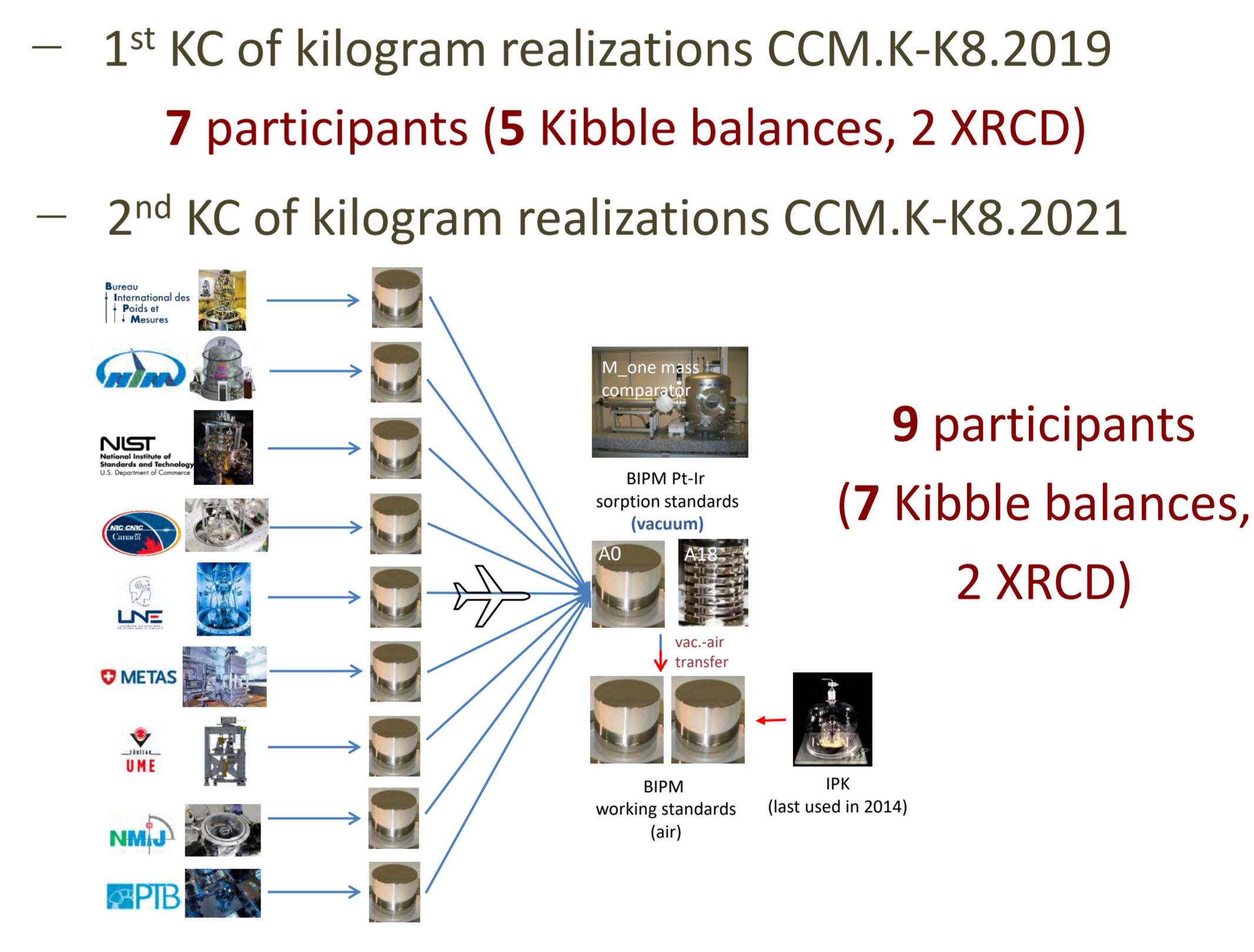
electronic torque realizer



ionization vacuum gauge



atomic gravity gradiometer



Facilitating dialogue between NMIs and stakeholders



Key Comparison of Realizations of the Kilogram

Eight NMIs and the BIPM participated in the second Key Comparison of Realizations of the Kilogram CCM.K-K8.2021. The number of participants increased by two compared to the first comparison carried out in 2019. Seven participants used Kibble balances, and two used ²⁸Si spheres for the mass measurement of the travelling standards. The mass comparisons of the transfer standards with respect to the BIPM working standards have been completed. The transfer standards have been returned and their mass stability verified by the participants. The analysis of the measurement

Note on the impact of the beginning of Phase 2 of the kilogram dissemination process on BIPM mass calibrations

Beginning of a new phase of the dissemination of the kilogram

Global comparability of measurements

- 2965 CMCs in 29 service categories
- 55 comparisons completed from 2019 to 2022
- Three guidance documents for supporting KCs and CMCs
 - *key comparison report template*
 - *guidelines for approval and publication of the final reports of key comparisons*
 - *guidelines for submission and review of CMCs*

