IONIZING RADIATION - RADIONUCLIDE METROLOGY

The BIPM develops new capabilities to demonstrate the **equivalence of standards for emerging radionuclides** by carrying out key comparisons with the Système International de Référence (SIR) supporting measurements in nuclear medicine, environmental monitoring, and for challenging-to-measure isotopes.

IMPACT

International references for measuring radioactivity, maintained through BIPM radionuclide metrology, give patients grounds to trust the safety and efficacy of nuclear medicine and radiopharmaceuticals, and give society confidence in environment monitoring and the safe management of radioactive waste.

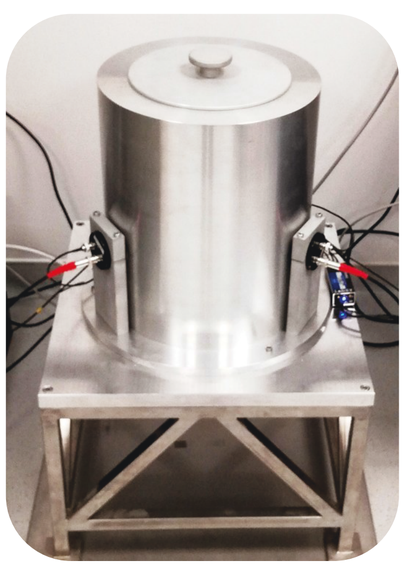
KEY ACHIEVEMENTS SINCE 2022

SIR 2.0: a replacement for the SIR is coming after 50 years of service

- A methodology has been developed for **a controlled transition to a new comparator with minimum impact on the Key Comparisons Reference Values.**
- Initial trials have demonstrated the potential to perform measurements at activity levels approximately ten times lower than those achievable with the current SIR.



Credit: BIPM



Credit: BIPM

New ESIR service: first comparisons in progress

The ESIR is an extension of the SIR designed to handle radionuclides that cannot be measured using the SIR ionization chambers.

Since 2025, the ESIR has supported **new BIPM.RI(II)-K5 key comparisons** for radionuclides including **^{99}Tc, ^{147}Pm and ^{241}Am. The first comparison report has recently been published.**

More SIRTI comparisons via RMO SIRTI copies

- The International Reference System Transfer Instrument (SIRTI), which enables **comparisons of short-lived radionuclides directly at national laboratories,** has continued to expand its capabilities to new radionuclides.
- **Coordination between the BIPM and Regional Metrology Organisations** has enabled the setup of SIRTI copies to reach more NMIs in a shorter timeframe.



Credit: BIPM