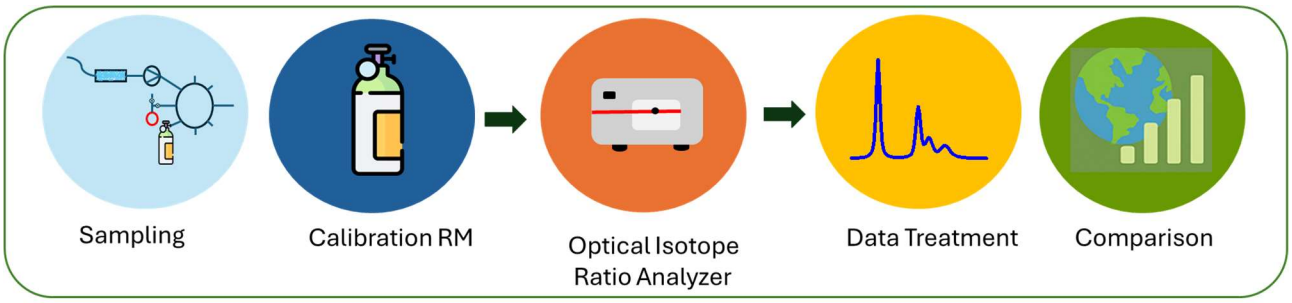

Harmonization of Optical Isotope Ratio Analyzer Calibration Practices in Atmospheric CO_2 and CH_4 Measurements

Date: September 9, 2025

Time: 7:00 AM – 11:20 AM (Eastern Daylight Time, EDT/ UTC–4)

Location: Online

Registration: https://nist.zoomgov.com/meeting/register/4sZ9u4LwQaSfHNidLqPJFg

Description: Virtual Workshop of the CCQM GAWG-IRWG Isotope Ratio Task Group

Moderator: Abneesh Srivastava (NIST, USA), Chair Isotope Ratio Task Group

Rapporteur: Christoph Nehrbass-Ahles (NPL, UK), Executive Secretary, Isotope Ratio Task Group

Facilitator: Kimberly Harris (NIST, USA), Member Harmonization Team, Isotope Ratio Task Group

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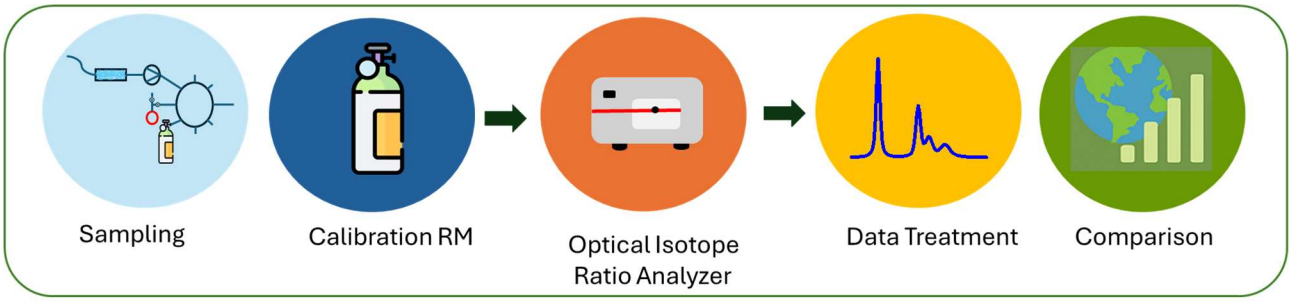
Workshop Scope

This workshop is organized by the Task Team on Harmonization of Calibration Practices for Optical Isotope Ratio Analyzers, under the Isotope Ratio Task Group of the CCQM GAWG-IRWG. The goal is to support consistent and transparent calibration practices for stable isotope ratio measurements of atmospheric carbon dioxide and methane using optical methods.

Optical analyzers are increasingly used for direct field-based measurements of isotopologues in carbon dioxide and methane. These instruments enable real-time, high-throughput atmospheric monitoring and are being adopted by research and observation networks globally. However, they present calibration challenges distinct from isotope ratio mass spectrometry, including spectral interferences, matrix effects, and variability in protocols.

This workshop aims to address the growing need for harmonized calibration approaches to improve comparability of optical isotope ratio data across sites and instruments. It aims to bring together stakeholders involved in reference material development, instrument design, measurement science, and standardization efforts across national metrology institutes, academia, industry, and international organizations. The program will feature real-world examples of calibration challenges and solutions, emerging best practice guidelines, and international standardization activities. Sessions will explore technical issues and opportunities to align practices through shared guidelines, with a view toward enabling future standardization.



Workshop Agenda

Welcome and Opening Remarks (7:00 – 7:10 EDT/ UTC-4)

Session 1: Applications (7:10-8:30 EDT/UTC-4)

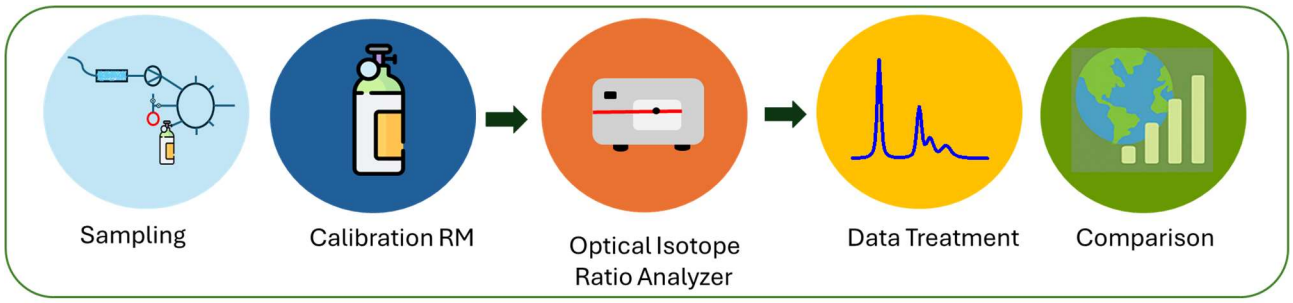
Examples of calibration challenges and solutions from laboratory and field use

Time	Title	Speaker
7:10 – 7:30	Field-Based Experiences with Calibration Procedures for Optical Isotope Ratio Measurements of CO_2 and CH_4	Martina Schmidt (Heidelberg University, Germany)
7:30 – 7:50	Calibration and Traceability Approaches for Optical Isotope Ratio Measurements in Atmospheric Monitoring of CO_2	Hanjun Eun (KRISS, South Korea)
7:50 – 8:10	Comparing CRDS and FTIR for CO_2 Isotopic Composition in Certified Reference Materials	Michela Sega (INRiM, Italy)
8:10 – 8:30	IAEA Initiatives for Harmonization of Carbon Isotope Delta Scale in CH_4 Analysis	Federica Camin (IAEA, Vienna)
8:30-8:40	Break	

Session 2: Guidelines (8:40-10:00 EDT/UTC-4)

Recommendations from recent harmonization guidelines and moving towards standardization

Time	Title	Speaker
8:40-9:00	Methodological Recommendations for CO_2 and CH_4 Isotope Measurements Using CRDS	Magdalena Hoffmann (Picarro, Netherlands)
9:00-9:20	Good Practice Guidelines for Optical Isotope Ratio Spectroscopy Measurements: STELLAR Project Recommendations	Chris Rennick (NPL, UK)
9:20-9:40	IAEA Guideline on Stable Carbon Isotope Ratio in Atmospheric CH_4 Using Laser Spectroscopy	Joachim Mohn (EMPA, Switzerland)
9:40 – 10:00	ISO TC/158 Activities on Standardization of Isotope Ratio Gas Analysis	Paul Brewer (NPL, UK)
10:00-10:10	Break	



Discussion – Harmonization and Future Directions (10:10-11:10 EDT/UTC-4)

Moderated discussion on technical challenges, calibration approaches, and opportunities to align practices with a view toward shared guidelines and future standardization. Participants are encouraged to submit and upvote questions in advance via Slido to help shape this session. The Slido link is:
https://app.sli.do/event/8sJdGewiX2L58vC4AX7kKA/live/questions

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Closing Remarks (11:10 – 11:20 EDT/UTC-4)
