CCQM Activities and Impact in Environment and Climate
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Abstract:
Climate change, greenhouse gas emissions and air quality are major global concerns with major impact on the environment and quality of life, with monitoring requirements and the control of emissions being incorporated into National legislations globally, e.g. EU air quality directives and the US Clean air act. Ensuring that informed decisions can be made on how to react to these environmental issues requires reliable monitoring data, and calibrations with gas standards of assured quality and accuracy. As a result 36 National Metrology Institutes (NMIs) participate regularly in the CCQM Gas Analysis Working Group (GAWG), and collectively provide over 1000 internationally accepted calibration and measurement capabilities for environmental gas standards. These are the basis of the gas standards and measurement services they offer to customers ranging from scientific researchers to industrial manufacturers. The NMIs work collaboratively to ensure the equivalence of their standards, and improvements in measurement and preparation techniques to reduce uncertainties to meet the most stringent scientific and technical needs. The presentation will focus on the improvements in the accuracy and international comparability of gas standards that has been achieved over the last ten years. Examples will include: surface ozone standards, where the agreement of standards has improved by a factor of ten and new absorption cross section measurements have been published in the Hartley Band with the smallest uncertainties recorded to date; methane in air standards for atmospheric greenhouse gas monitoring, with a factor of fifteen improvement in the equivalence of standards achieved, including comparisons with standards used by the Global Atmosphere Watch Network of the World Meteorological Organization (WMO) as well as future plans for the comparison of carbon dioxide in air standards; NOx in nitrogen standards, with the first comparison for nitrogen dioxide standards completed resulting in reduced uncertainties for NO2 and HNO3 measurements.