Requirements for New Measurements of the Absorption Cross-Section of Ozone for Accurate Determination of Ozone Concentration

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The reference method for measurement of ground level ozone concentration is based on UV photometry, with the NIST SRP ozone reference standard acting as the primary standard for numerous national and international ozone monitoring networks. Several replicas of this instrument are maintained by the BIPM, one of them being the reference standard for international comparisons of national ozone standards coordinated by the BIPM. During the last international comparison, the two gas phase titration systems of the NIES and the BIPM, which are realizations of an independent primary method, were also included in the comparison. The (2 to 3) % discrepancy observed between both methods raises the issue of our present understanding of the ozone absorption cross-section, which represents the major uncertainty component in measurements based on UV photometry. The poster will summarize progress in evaluating measurement biases in the Standard Reference Photometer, including a proposal for a value for the ozone absorption cross-section uncertainty which could be used until there is sufficient experimental data to assign a new value and uncertainty to the ozone absorption cross-section in the UV range.

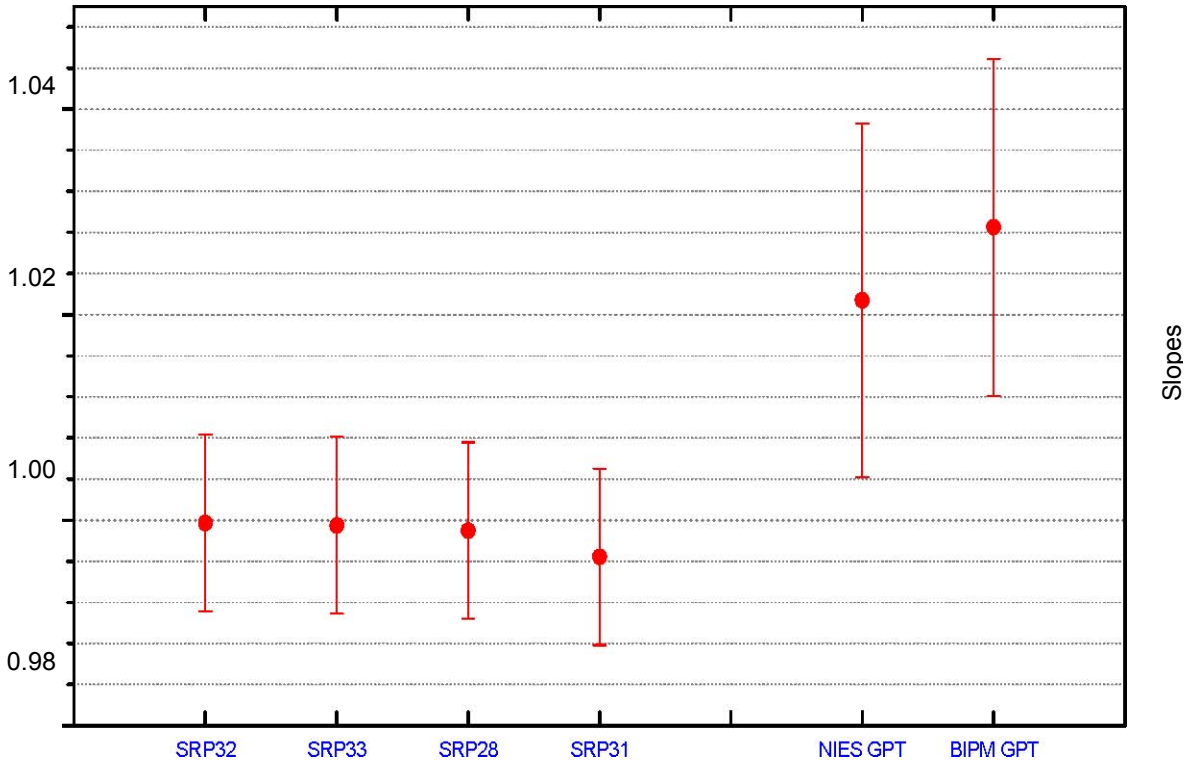

Figure 1. Comparability between ozone mole fraction measurements in the range (0 to 500) nmol.mol^{-1} performed by the two gas phase titration systems of the NIES and the BIPM with the five Standard Reference Photometers of the BIPM. The reference is here BIPM-SRP27.