

Intercomparison of N₂O₅ by LOPAP and pulsed CRDS measurements at the SAPHIR chamber

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During the ACCENT & EUROCHAMP NO₃ and N₂O₅ intercomparison campaign in the SAPHIR simulation chamber a recently developed wet chemical LOPAP instrument for the measurement of HNO₃ [1] was used. Since the instrument also quantitatively samples N(V) from N₂O₅ [1] and since under many experimental conditions formation of N₂O₅ was favoured over that of HNO₃, the LOPAP data was also used to quantify the concentration of N₂O₅. N₂O₅ was obtained by subtraction of background HNO₃ for experiments for which NO₃/N₂O₅ were quickly removed by the addition of NO or by the photolysis with natural sunlight, not affecting HNO₃ on a short time scale. Excellent agreement was observed between the corrected LOPAP N₂O₅ data and pulsed CRDS data from the NOAA ARNOLD instrument. For a N₂O₅ concentration range 0-2200 ppt, a slope LOPAP/NOAA of 1.01 and an insignificant intercept of 13 ppt was obtained for all data. The intercomparison confirms the high specified accuracy of both instruments. In addition, the data confirms the quantitative interference of the LOPAP instrument against N₂O₅ [1], which is a general problem of all wet chemical HNO₃ instruments, but which has been not considered up to now.

[1] Kleffmann J., T. Gavriloaiei, Y. Elshorbany, M. Ródenas, and P. Wiesen: Detection of Nitric Acid (HNO₃) in the Atmosphere using the LOPAP Technique, *J. Atmos. Chem.*, 2007, **58**(2), 131-150.