



Intercomparison of a new ultra-sensitive NO₂-LOPAP against commercial NO₂ instruments and the FTIR technique

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Measurements of NO₂ have been performed with many techniques in the past in the atmosphere and in simulation chambers. However, these techniques are either expensive and not trivial in their application (for example: DOAS, FTIR, CRDS, LIF, REMPI) or are affected by several interferences. Luminal type NO₂ instruments for example, show strong interferences against PAN species and chemiluminescence instruments using Mo-converters measure also other NO_y species. But also chemiluminescence instruments using photolytic converters have been shown to be affected by negative interferences in the presence of high concentrations of hydrocarbons in smog chambers und tunnel studies. To overcome these problems, a new ultra-sensitive LOPAP instrument for the detection of NO₂ has been developed. The instrument has a detection limit of 1 ppt, shows a linear response in the concentration range 1 ppt-200 ppb and is not affected by interferences against, NO, HONO, HNO₃, N₂O₅, PAN, O₃, H₂O₂, aromatic hydrocarbons including nitroaromatics. Excellent agreement was obtained between the LOPAP and an Eco-Physics chemiluminescence instrument during field measurements at the University of Wuppertal. In addition, good agreement was obtained between the LOPAP and the FTIR technique in a simulation chamber including complex photosmog experiments. Deviations to commercial NO₂ instruments during these experiments will be discussed.