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4-D comparison method to study the NO_y partitioning in summer polar stratosphere – Influence of aerosol burden

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Abstract. On 21–22 August 2001, NO, NO_2 and HNO_3 mixing ratio profiles were measured at high latitudes during sunset and sunrise using the Limb Profile Monitor of the Atmosphere (LPMA) and the DOAS experiments under stratospheric balloon. Photochemical simulations using the chemistry module of the Reprobus Chemistry Transport Model (CTM) that are constrained by ozone and total NO_y balloon observations reproduce well the partitioning of NO_x and NO_y when model results are calculated at the exact time and location of the measurement for each tangent altitude. Taking the recently recommended reaction rate coefficients for the NO_y partitioning (JPL-2003) and using realistic aerosol surface area in order to initialise the model leads to an agreement between calculations and measurements better than 10% all over the covered altitude range.

Final Revised Paper (PDF, 789 KB) | Discussion Paper (ACPD)

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