



## **Modelling disturbed stratospheric Chemistry during solar induced NO<sub>x</sub> Intrusions observed by MIPAS-ENVISAT**

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Energetic particle precipitation during solar active periods induce enhancements of NO<sub>x</sub> in the lower thermosphere/mesosphere which can be transported to the stratosphere within the polar vortex. The quantitative contribution of these NO<sub>x</sub> intrusions to ozone chemistry in the stratosphere is still under discussion. Here we present simulations with the 3D model KASIMA where NO<sub>x</sub> enhancements in the lower mesosphere have been taken from the observations of the MIPAS instrument on the ESA satellite ENVISAT. Covering the period from mid 2002 to early 2004 these observations represent one of the most complete data set including the strong solar proton event in fall 2003 and intrusions connected to auroral events during the Arctic and Antarctic winters. The comparison of the disturbed run with an undisturbed model run allows a quantitative assessment of the long-term influence of NO<sub>x</sub> intrusions on stratospheric chemistry in general and the ozone concentration in particular. Persistent reduction of ozone concentration can be followed in the simulation for several months in the middle stratosphere but is restricted to high latitudes. Including ion cluster chemistry in the model the HNO<sub>3</sub> build-up observed by MIPAS/ENVISAT in Antarctic winter 2003 and the subsequent Arctic winter can be reproduced qualitatively