



Analysis of NO_x mixing ratios in the middle atmosphere determined by HALOE data

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The chemical composition of the middle atmosphere can be strongly influenced by Solar Proton Events (SPEs) and Energetic Electron Precipitation Events (EPEs). These events are well known sources of NO_x (N, NO, NO₂) and HO_x (H, OH, HO₂), which both contribute to ozone loss in the middle atmosphere. Due to its long lifetime significant amounts of NO_x produced by large particle events in the mesosphere and the upper stratosphere can be transported down into the middle and lower stratosphere during polar winter, where NO_x is a key species in ozone loss. Thus large particle events can potentially contribute significantly to stratospheric ozone loss. This study uses NO_x measurements of the Halogen Occultation Experiment (HALOE) instrument onboard the UARS satellite covering the years 1991 - 2005, to investigate mesospheric NO_x production during more than one solar cycle.