



Analysis of MIPAS NO_y Satellite Retrievals in the Upper Troposphere

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Reactive nitrogen compounds (NO_y) (i.e. mixture of NO + NO₂ + HNO₃ + PAN + 2N₂O₅ + HONO + ClONO₂ + HO₂NO₂) control the important greenhouse gas like ozone budget in upper troposphere (UT) region and corresponding radiative impacts. The present study investigates the usefulness of Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) satellite data for the evaluation of atmospheric chemistry model results in the UT. We have analyzed data from the MACC reanalysis and output from 18 atmospheric chemical transport models which participated in the TFHTAP multi-model inter-comparison activity. The global distribution of HNO₃ and PAN derived from MIPAS at 12 km for 2007-2009 are also compared with air craft observation data. MIPAS and model derived vertical profiles of above NO_y species are compared at various geographical regions. First results indicate a potential high bias in the MIPAS retrievals for HNO₃, while the magnitude of PAN concentrations generally agrees well between MIPAS, models, and aircraft observations. However, in the simulation results there are distinct features in the geographical distribution of PAN over biomass burning regions which are absent in the MIPAS data.