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Comparison of EMAC model results to satellite observations in the winter 2008/09 within the HEPPA-II intercomparison

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The High Energy Particle Precipitation in the Atmosphere (HEPPA) initiative compares several satellite observations to results of different atmospheric models. In the current intercomparison the focus is on indirect effects due to energetic particle precipitation (EPP) after the Major Stratospheric Warming during the winter 2008/09. After this event large amounts of NO_x are transported downwards from the thermosphere into the mesosphere, despite low geomagnetic activity during this winter and therefore low thermospheric production of NO_x. In the HEPPA-II study we focus on the assessment of the EPP source, vertical coupling and on composition changes in the stratosphere and mesosphere due to indirect EPP effects.

In our presentation we will show mid-atmospheric composition changes in the model EMAC (ECHAM5/MESSy Atmospheric Chemistry) within the HEPPA-II intercomparison. Besides NO_x we will show results for other NO_y family members, some dynamical tracers and the meteorological conditions in EMAC. We performed a EMAC simulation with prescribed observed NO_x vmr from MIPAS at the upper model boundary. Additionally we performed a model run without prescribed NO_x to distinguish between indirect effects due to EPP and other atmospheric effects.