Geophysical Research Abstracts,
Vol. 11, EGU2009-12473, 2009
EGU General Assembly 2009

Evaluation of transient CCM simulations with ozone sondes, lidar and Dobson stations with focus on northern midlatitudes and tropics

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Ozone and temperature profiles of a transient simulation with the chemistry climate model ECHAM5/MESSy (EMAC) from 1960 to 2000 (CCMVal-REF1) are compared with ozone sonde and lidar data. We focus on the longterm timeseries at the station Hohenpeissenberg for stratosphere and troposphere but show also examples for other northern midlatitude, subtropical and tropical stations using the WOUDC database in Toronto. We try to separate patterns related to the QBO (generated by the model but weakly guided), volcanoes, El Nino and other natural and anthropogenic forcings. The analysis is based on monthly means and standard deviations, but also daily data. For Hohenpeissenberg we include also one year of a simulation with nudged tropospheric meteorology into the comparison to separate the effects of synoptic variations. We show that the model is in most cases able to reproduce the observed seasonal and interannual variability in the timeseries of total ozone between the equator and about 50N within the temporal standard deviations of the monthly means.