



Gaseous and particulate pollutants in the upper troposphere and lower stratosphere (UTLS) of the Asian Monsoon region simulated by the CCM EMAC

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Results of a transient simulation for 2002 to 2011 using the chemistry climate model EMAC with interactive tropospheric and stratospheric aerosol processes are presented. The simulation includes anthropogenic gaseous emissions based on EDGAR but also more than 100 volcanic SO₂ injections into the UTLS using estimates from satellite data. The lower boundary conditions for the different aerosol types are based on AEROCOM. We demonstrate that in the Asian monsoon region CO and organic and black carbon are strongly enhanced in the UTLS. We also show that the monsoon circulation transports anthropogenic SO₂, originating in China, to the lower stratosphere, as well as volcanic SO₂ injected into the upper troposphere in East Africa and Indonesia. The results are compared with MIPAS/ENVISAT observations.