Geophysical Research Abstracts,
Vol. 11, EGU2009-10325, 2009
EGU General Assembly 2009

Exploitation of satellite data for assessing air quality over North America with a chemical transport model

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We present results from the integration of data from different satellite instruments to assess North American surface ozone abundances in the GEOS-Chem model for August 2006. We assimilate observations of tropospheric ozone from the Tropospheric Emission Spectrometer (TES) with emissions of isoprene derived from formaldehyde data from the Ozone Monitoring Instrument (OMI) and emissions of NOx derived from NO2 data from the SCanning Imaging Absorption SpectroMeter for Atmospheric CHartographY (SCIAMACHY). In previous work we have shown that assimilation of the TES data provides an estimate of the contribution of background ozone to summertime surface ozone abundances over North America of 20-40 ppb. We quantify here the constraints on estimates of ozone production in the North American boundary layer provided by SCIAMACHY and OMI data. We also assess the impact of discrepancies in the description of vertical mixing in the boundary layer in the model on the simulated surface ozone abundances.