

# Upper-Tropospheric and Lower-Stratospheric Ozone from Assimilation of EOS-Aura Data into GEOS-5

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Accurate knowledge of the abundance, structure and variability of ozone fields in the Upper Troposphere – Lower Stratosphere layer (UTLS) is critical to our understanding of Stratosphere – Troposphere Exchange processes, radiative forcing and the tropospheric ozone budget. Data assimilation provides a unique opportunity to generate a representation of global ozone fields by combining satellite observations with general circulation model output in a manner that is consistent with atmospheric dynamics. In this paper we present validation results of an eight year long assimilation of data from the Ozone Monitoring Instrument (OMI) and the Microwave Limb Sounder (MLS), both on the EOS-Aura satellite, into the GEOS-5 Data Assimilation System (GEOS-DAS) developed at NASA's Global Modeling and Assimilation Office (GMAO) in collaboration with NCEP. This version of GEOS-DAS uses state-dependent background error variances for ozone, which help resolve sharp tracer gradients in regions of high dynamical variability. In particular, we will show that small-scale laminar structures in the UTLS ozone are well resolved in this product despite a relatively low vertical resolution of the input data. We will demonstrate that sharp ozone gradients in the vicinity of the tropopause are correctly represented in this assimilation allowing studies of cross-tropopause ozone transport.

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