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## **Influence of the Brewer-Dobson Circulation on the Middle/Upper Tropospheric O<sub>3</sub>**

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Middle and upper tropospheric ozone is affected by the downwelling transport of air from the stratosphere, where most of ozone is produced. We use the data obtained by Earth Observing System (EOS) Tropospheric Emission Spectrometer (TES) and Microwave Limb Sounder (MLS) to study ozone from the middle troposphere to the lower stratosphere. Comparisons with model results are made. An off-line chemical transport model (MOZART-2) driven by the NCEP1 and MACCM3 circulations and the on-line model CAM-CHEM, a newly developed model at NCAR, are used to simulate the distribution of ozone from the surface to ~5 mbar. We find that the phase of the seasonal cycle of the modeled O<sub>3</sub> in the mid-troposphere is off by ~1-2 months compared with that of the observed O<sub>3</sub>, while the phase between models and observations is good in the lower stratosphere. This suggests a gap of our understanding of the cross tropopause transport in the current model.