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Global distribution of tropospheric ozone from satellite measurements using the empirically corrected tropospheric ozone residual technique: Identification of the regional aspects of air pollution

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Abstract. Using coincident observations of total ozone from the Total Ozone Mapping Spectrometer (TOMS) and stratospheric ozone profiles from the Solar Backscattered Ultraviolet (SBUV) instruments, detailed maps of tropospheric ozone have been derived on a daily basis over a time period spanning more than two decades. The resultant climatological seasonal depictions of the tropospheric ozone residual (TOR) show much more detail than an earlier analysis that had used coincident TOMS and Stratospheric Aerosol and Gas Experiment (SAGE) ozone profiles, although there are many similarities between the TOMS/SAGE TOR and the TOMS/SBUV TOR climatologies. In particular, both TOR seasonal depictions show large enhancements in the southern tropics and subtropics in austral spring and at northern temperate latitudes during the summer. The much greater detail in this new data set clearly defines the regional aspect of tropospheric ozone pollution in northeastern India, eastern United States, eastern China, and west and southern Africa. Being able to define monthly climatologies for each year of the data record provides enough temporal resolution to illustrate significant interannual variability in some of these regions.

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