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Ozone variations in the tropical upper troposphere and lower stratosphere based on Aura MLS and sonde data

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For over a decade, global daily ozone profiles from the upper troposphere to the mesosphere have been measured by the Microwave Limb Sounder on the Aura spacecraft. This dataset is explored with a focus on the tropical upper troposphere and lower stratosphere (UTLS). We compare the MLS ozone profiles to ozonesonde measurements from the Southern Hemisphere Additional Ozonesondes (SHADOZ) network and its continuing time series of reliable low latitude ozone profile records. We perform time series comparisons and multiple regression analyses, and we assess how well these two sets of ozone profiles agree, despite their differences in sampling and resolution. The multiple regression is based on a model with proxies that include quasi-biennial oscillation (QBO) and multivariate El Niño/Southern Oscillation (ENSO) index (MEI) terms, which represent significant known components of low frequency variability in ozone. We also present estimates of the underlying linear trends in UTLS ozone for 2005-2015.