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Highlights from the 11-year record of tropospheric ozone from OMI/MLS and continuation of that long record using OMPS measurements

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Since October 2004 the Ozone Monitoring Instrument (OMI) and Microwave Limb Sounder (MLS) onboard the Aura satellite have provided over 11 years of continuous tropospheric ozone measurements. These OMI/MLS measurements have been used in many studies to evaluate dynamical and photochemical effects caused by ENSO, the Madden-Julian Oscillation (MJO) and shorter timescales, as well as long-term trends and the effects of deep convection on tropospheric ozone. Given that the OMI and MLS instruments have now extended well beyond their expected lifetimes, our goal is to continue their long record of tropospheric ozone using recent Ozone Mapping Profiler Suite (OMPS) measurements. The OMPS onboard the Suomi National Polar-orbiting Partnership NPP satellite was launched on October 28, 2011 and is comprised of three instruments: the nadir mapper, the nadir profiler, and the limb profiler. Our study combines total column ozone from the OMPS nadir mapper with stratospheric column ozone from the OMPS limb profiler to measure tropospheric ozone residual. The time period for the OMPS measurements is March 2012 – present. For the OMPS limb profiler retrievals, the OMPS v2 algorithm from Goddard is tested against the SASKatchewan radiative TRANsfer (SASKTRAN) algorithm. The retrieved ozone profiles from each of these algorithms are evaluated with ozone profiles from both ozonesondes and the Aura Microwave Limb Sounder (MLS). Effects on derived OMPS tropospheric ozone caused by the 2015-2016 El Nino event are highlighted. This recent El Nino produced anomalies in tropospheric ozone throughout the tropical Pacific involving increases of $\sim$10 DU over Indonesia and decreases $\sim$5-10 DU in the eastern Pacific. These changes in ozone due to El Nino were predominantly dynamically-induced, caused by the eastward shift in sea-surface temperature and convection from the western to the eastern Pacific.