Comparison of SAGE III/ISS ozone and aerosol profiles with correlative measurements

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The SAGE series of instruments started with Stratospheric Aerosol Monitor (SAM) in 1975, SAM II, Stratospheric aerosol and gas Experiment I (SAGE I) in 1978, SAGE II in 1984, and SAGE III M3M in 2001, spanning over26 years. On February 19, 2017, SAGE III was launched to the International Space Station (ISS) to resume the SAGE series measurements. Similar to its predecessor, SAGE III/ISS utilize solar occultations to provide high-resolution vertical profiles of aerosol extinction at multi- wavelengths, the molecular densities of ozone, nitrogen dioxide, and water vapor, as well as profiles of temperature, pressure, and cloud presence.

For many years, SAGE II have been the benchmark for studies related to stratospheric changes, trend analysis, and international assessments. The recent deployment of SAGE III instrument will ensure the resumption of valuable solar occultation dataset which will provide atmospheric data essential for the interpretation and calibration of other satellite sensors, including OMPS LP.

In this study we will compare SAGE III/ISS latest release of ozone and aerosol measurements with OMPS LP, MLS, and OSIRIS as well as balloon sonde measurements. Comparing SAGE III to existing instruments will both validate SAGE III data products and link the SAGE III data sets to current measurement and extend these existing long-term record of atmospheric constituents.

Key words: ozone, aerosol, atmosphere, climate