

Global Observations of Aerosol and Ozone from SAGE III ISS – A First Year Showcase

K.R. Leavor¹, M. Roell² and D. Flittner²

¹Science Systems and Applications, Inc. (SSAI), Lanham, MD 20706; 757-864-3828, E-mail: kevin.r.leavor@nasa.gov

²NASA Langley Research Center, Hampton, VA 23681

The Stratospheric Aerosol and Gas Experiment III on the International Space Station (SAGE III ISS) achieved first light on 17 March 2017. Near-continuous observations of ozone, aerosol, and related species have been made covering altitudes from the upper troposphere to the mesosphere and latitudes from 67° S to 69° N. Historically, SAGE II's stable directly-measured profiles of atmospheric transmission have been used by the atmospheric science community as a standard in aerosol and ozone observations and trends. SAGE III ISS has made over one year of similar observations, beginning a new highly-anticipated record. Measurement capabilities and observations of aerosol and ozone spanning the first year of observation are presented, showcasing SAGE III ISS's first year in orbit. In that first year, SAGE III ISS has made observations of stratospheric pyrocumulus resulting from wildfires in the United States Pacific Northwest and British Columbia, Canada, validated unique measurements through an Antarctic polar vortex air mass, and compared well against other contemporary satellite observations. These early results are highly indicative of a mission with significant potential capable of adding to and renewing the existing SAGE record.

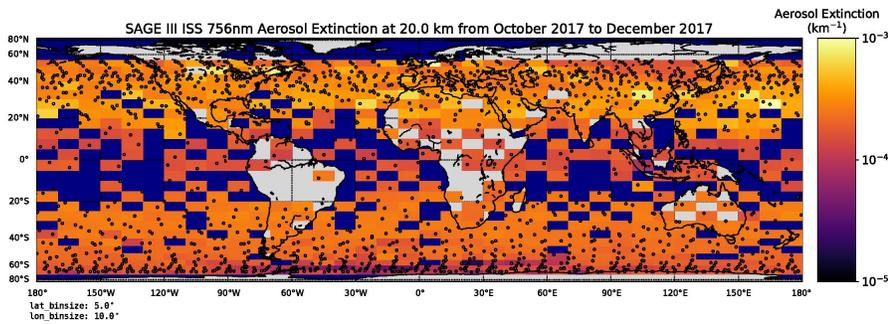


Figure 1. Geospatial averages of 756nm aerosol extinction coefficients retrieved at 20 km in the time period following the extinguishing of the 2017 North American summer wildfires. Enhanced extinction is observed at latitudes North of 20° N.

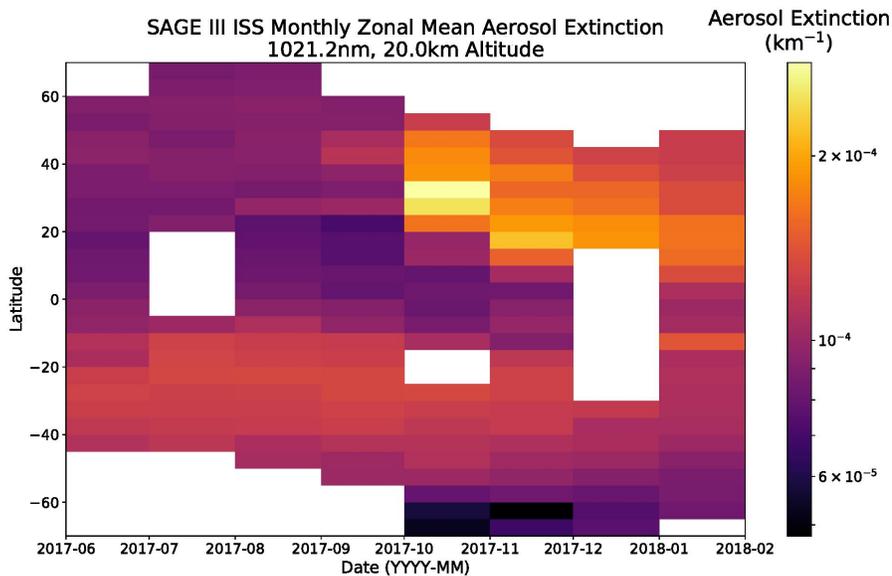


Figure 2. Monthly zonal means of 1021 nm aerosol extinction coefficient from the beginning of the SAGE III ISS public data release in June 2017 through January 2018. Significant enhancement is visible as early as September, with wide dispersion across latitudes observable from October onward.