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Inter-comparison study of stratospheric particle size distribution parameters derived from SAGE III/ISS extinction measurements

Two methods of deriving monomodal particle size distribution (PSD) values from SAGE III/ISS extinction measurements have recently been produced. Wrana et al. (2021) using SAGE III/ISS measurements at 449, 756, and 1544 nm construct a lookup table of extinction ratios to retrieve monomodal lognormal PSD parameter values. Knepp et al. (2024) likewise uses seven of the SAGE III/ISS aerosol channels to construct lookup tables based on extinction ratios to derive monomodal lognormal PSD parameter values. Both methods are attempting to constrain the aerosol PSDs that underlie SAGE III/ISS measurements.

We present here a comparison of those two methods among the many different aerosol loading events (Hunga-Tonga, australian wildfires, raikoke, etc.), the low aerosol “background” periods, and at the various latitudes and altitudes. Shown, as well, are the two methods performance against NOAA POPS derived PSD values.

Topic

Aerosols and clouds

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