



Merging the SAGE II and OSIRIS Stratospheric Aerosol Records

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The Optical Spectrograph and InfraRed Imaging System (OSIRIS) instrument on the Odin satellite, launched in 2001 and currently operational, measures limb-scattered sunlight from which profiles of stratospheric aerosol extinction at 750nm are retrieved. The Stratospheric Aerosol and Gas (SAGE) II instrument was operational from 1985 to 2005, and provided aerosol extinction at several visible and near infrared wavelengths. This work compares the SAGE II and OSIRIS aerosol extinction measurements during the four years of instrument overlap by interpolating the SAGE II data to 750nm using the 525 and 1020nm channels. Agreement is generally favourable in the tropics and mid-latitudes with differences less than 10% for the majority of the aerosol layer. However, near the UTLS and outside of the tropics agreement is poorer and reasons for this are investigated.

Comparisons between the OSIRIS and SAGE II aerosol extinction measurements at 750nm are used to develop a merged aerosol climatology as a function of time, latitude and altitude at the native SAGE II wavelength of 525nm. Error due to assumptions in the OSIRIS retrieval and wavelength conversion are explored through simulation studies over a range of particle size distributions and is found to be approximately 20% for the majority of low-to-moderate volcanic loading conditions and OSIRIS geometries. Other sources of error such as cloud contamination in the UTLS are also explored.