



OMI UV absorbing aerosol index as a tracer for transport of Australian biomass burning aerosols

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The Dutch-Finnish Ozone Monitoring Instrument (OMI) aboard the NASA EOS-Aura satellite is a compact nadir-viewing, wide-swath imaging spectrometer that provides daily global coverage with high spatial resolution. An important quality of OMI is that it measures Earth reflectance spectra both in the visible and the ultraviolet parts of the electromagnetic spectrum (270-500 nm) with high spectral resolution. This makes OMI especially suited for retrieving atmospheric aerosol properties from space, and in particular for distinguishing UV-absorbing aerosols, such as desert dust and biomass burning aerosols, from weakly absorbing aerosols and clouds. A convenient observable in this respect is the UV absorbing aerosol index (AAI), which is a measure of the departure of the observed spectrum from that of a hypothetical pure molecular atmosphere. The AAI takes near-zero values for clouds and weakly absorbing aerosols, and positive values for desert dust and biomass burning aerosols.

In a case study, we investigate the transport of biomass burning aerosols originating from the numerous wildfires that raged across Australia in November and December of 2006. Some of these plumes can be tracked for more than a week, as they are transported to Antarctica and across the Pacific Ocean to South America. OMI AAI and cloud observations are compared with correlative data and images recorded by other A-Train satellite sensors such as the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard the NASA EOS-Aqua satellite and the lidar system aboard the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO). The observed transport phenomena are supported by air parcel trajectory analyses using the NOAA online HYsplit model.