

Title: **April 1998 Asian dust event over the Columbia Plateau**

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Abstract: Surface-based radiometers can be used to assess the atmospheric aerosol burden. During 1998, two multifilter rotating shadow-band radiometers (MFRSRs), operated by Washington State University (WSU) and by the USDA UV-B program, were used to collect data on the Columbia Plateau atmosphere. Analysis of these data by an automated Langley algorithm provided retrievals for total optical thickness, allowing for calculation of aerosol optical thickness (AOT) and the top-of-atmosphere (TOA) instrument signal. Statistical evaluation of the TOA signal permitted recalculation of optical thickness using the Bouguer-Lambert-Beer law and resulted in improved estimates of aerosol optical thickness (AOT). Results for AOT and the associated Angstrom parameters are presented here for an April 1998 dust event for two colocated Columbia Plateau sites. AOT at 500 nm went from background levels (seasonally dominated by regional windblown dust) of similar to 0.2 to more than 0.4 during the event maximum on April 27, not returning to normal levels until April 30. Comparison of 500-nm AOT between the two MFRSR showed a root-mean-square (RMS) difference of 0.016. The Angstrom exponent alpha reached a minimum of similar to 0.2, and the beta coefficient reached a maximum of similar to 0.35, both on April 27, coincident with the AOT maximum. Contemporaneous aerosol sampling in Spokane, Washington, provided (1) elemental data that strongly support our interpretation of this event as an influx of Asian dust without significant sulfur enrichment and (2) event maximum PM10 measurements similar to 80 mug/ml consistent with Pullman event maximum AOT results, assuming a 3-4 km thick dust layer.

KeyWords Plus: AEROSOL OPTICAL DEPTH; LONG-RANGE TRANSPORT; SUN-PHOTOMETER; RADIOMETERS; AIR; INSTRUMENT; PARTICLES; RADIATION; RETRIEVAL; PROGRAM

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