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## Aerosol single-scattering albedo and asymmetry parameter from MFRSR observations during the ARM Aerosol IOP 2003

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**Abstract.** Multi-filter Rotating Shadowband Radiometers (MFRSRs) provide routine measurements of the aerosol optical depth ( $\tau$ ) at six wavelengths (0.415, 0.5, 0.615, 0.673, 0.870 and 0.94  $\mu\text{m}$ ). The single-scattering albedo ( $\pi_0$ ) is typically estimated from the MFRSR measurements by assuming the asymmetry parameter ( $g$ ). In most instances, however, it is not easy to set an appropriate value of  $g$  due to its strong temporal and spatial variability. Here, we introduce and validate an updated version of our retrieval technique that allows one to estimate simultaneously  $\pi_0$  and  $g$  for different types of aerosol. We use the aerosol and radiative properties obtained during the Atmospheric Radiation Measurement (ARM) Program's Aerosol Intensive Operational Period (IOP) to validate our retrieval in two ways. First, the MFRSR-retrieved optical properties are compared with those obtained from independent surface, Aerosol Robotic Network (AERONET), and aircraft measurements. The MFRSR-retrieved optical properties are in reasonable agreement with these independent measurements. Second, we perform radiative closure experiments using the MFRSR-retrieved optical properties. The calculated broadband values of the direct and diffuse fluxes are comparable ( $\sim 5 \text{ W/m}^2$ ) to those obtained from measurements.

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