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Simultaneous measurement of sphericity and scattering phase functions from single atmospheric aerosol particles in Las Cruces, NM SEAN MARTIN, KEVIN APTOWICZ, West Chester University, YONG-LE PAN, US Army Research Laboratory, RICHARD CHANG, Yale University, RONALD PINNICK, US Army Research Laboratory — We report upon the collection of elastic light scattering patterns with high angular resolution and large angular coverage from single atmospheric aerosol particles in Las Cruces, NM. Radiative forcing due to aerosols is a primary source of uncertainty in climate models. Characterization of tropospheric aerosols is carried out by inversion of optical measurements made remotely by land-based instruments and satellites. An integral part of the retrieval procedure is accounting for particle shape (i.e. nonsphericity). In-situ and laboratory measurements of aerosol particles play a critical role in validating and constraining the inversion procedure used in climate models. In this work, we utilize high angular resolution and large angular coverage scattering patterns to simultaneously calculate particle sphericity and the scattering phase of individual atmospheric particles. We examine the relationship between a particle's sphericity and its phase function. In addition, we explore the differences in phase function between nonspherical particles that have high sphericity (i.e. complex particles with overall round shape) and spherical particles. We conclude by commenting on the possible impacts of our findings on inversion procedures used in aerosol characterization.

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