

The Sensitivity of MISR Multi-angle Imaging Aerosol Retrievals Over Dark Water to Assumed Particle Properties, Based on ACE-Asia Field Observations

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On six occasions spanning the ACE-Asia field experiment in Spring 2001, the multi-angle imaging MISR instrument, flying aboard the NASA Earth Observing System's Terra satellite, took high-resolution data over a 360-km-wide swath, coincident with observations by multiple instruments on two or more participating surface and airborne stations. The cases capture a range of clean, dusty, and polluted aerosol conditions, and represent some of the best opportunities during ACE-Asia for comparative studies among intensive and extensive aerosol observations, in their environmental context. Over thirty ACE-Asia investigators are participating in a study that pulls together the multi-platform observations, to create as complete a picture as possible of atmospheric and surface conditions for these six cases. For several cases, environmental detail available at the time of satellite over-flight is unprecedented.

This presentation uses results from the multi-platform study as ground truth, to critically test the sensitivity of MISR aerosol retrievals to assumed particle microphysical properties, a key step in refining the satellite multi-angle retrieval algorithms. We review the assumptions made in the MISR algorithms about particle microphysical properties for sea salt, sulfate, biomass burning, and mineral dust components in light of the coincident field data, and discuss the sensitivity of the dark water retrieval algorithm to column aerosol optical depth and aerosol component mixture.