



Aerosol retrievals from the ACEPOL Campaign

Guangliang Fu (1), Otto Hasekamp (1), Antonio di Noia (1), Jeroen Rietjens (1), Martijn Smit (1), Brian Cairns (2), Andrzej Wasilewski (3), David Diner (4), Feng Xu (4), Vanderlei Martins (5), Kirk Knobelspiesse (6), Sharon Burton (7), Chris Hostetler (7), John Hair (7), and Richard Ferrare (7)

(1) SRON, Netherlands Institute for Space Research, (2) NASA GIS, (3) Trinnovim LLC, (4) NASA JPL, (5) Earth and Space Institute, UMBC, (6) NASA Ames Research Center, (7) NASA Langley Research Center

In this study, we present aerosol level-2 retrieval results from ACEPOL (Aerosol Characterization from Polarimeter and Lidar) campaign, which was a joint initiative between NASA and SRON (NL) and took place October-November 2017 over the western part of the United States. We perform aerosol retrievals using the SRON multimode algorithm on SPEX airborne LIC data, the Research Scanning Polarimeter (RSP) L1 data, and the Airborne Multi-angle SpectroPolarimeter Imager (AirMSPI) L1B2 data. The AERONET data and the High Spectral Resolution Lidar-2 (HSRL2) data are used to validate polarimeter retrieved/diagnostics aerosol properties. The polarimeter retrievals are based on SRON 5-mode approaches. Other multimode (from 6 to 10 modes) tests show similar performances with the 5-mode approach.

Validations with AERONET show that SPEX, RSP, and AirMSPI retrievals achieve similar performances on aerosol optical thickness (AOT) and they agree well with AERONET. Here, we also show that AirMSPI-AERONET based on the SRON algorithm compares well with that based on the JPL algorithm. The Angstrom Exponent is compared between SPEX-AERONET and RSP-AERONET when $AOT > 0.1$. Validations with HSRL2 are performed on two days. One day with low aerosol (AOD in range 0.02-0.14) and one day with measurements of an inhomogeneous smoke plume with high AOD (including AOD values > 1.0). Considering the data collocations among instruments, we compare SPEX-HSRL2, RSP-HSRL2, and SPEX-RSP for these two cases. SPEX and RSP both compare well to HSRL2 for AOT, backscatter coefficients, and depolarization ratio.