

Title:

A42A-04: Determination of Cloud Thermodynamic Phase with Ground Based, Polarimetrically Sensitive, Passive Sky Radiometers (Invited)

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Authors

- [Kirk Knobelspiesse](#)
 - NASA Ames Research Center
- [Bastiaan van Dierenhoven](#)
 - Columbia University of New York
- [Alexander Marshak](#)
 - NASA Goddard Space Flight Center
- [Stephen Dunagan](#)
 - NASA Ames Research Center
- [Brent Holben](#)
 - NASA Goddard Space Flight Center
- [Ilya Slutsker](#)
 - Science Systems and Applications, Inc.

When observed from the ground, optically thick clouds minimally polarize light, while the linear polarization direction (angle) of optically thin clouds contains information about thermodynamic phase. For instruments such as the Cimel radiometers that comprise the AEROSOL ROBOTIC NETWORK (AERONET), these properties can also be exploited to aid cloud optical property retrievals. Using vector radiative transfer simulations, we explore the conditions most favorable to cloud thermodynamic phase determination, then test with actual AERONET data. Results indicate that this technique may be appropriate for some, but not all, conditions, and motivate a deeper investigation about the polarization direction measurement capability of Cimel instruments, which to date have been primarily used to determine degree of polarization. Recent work explores these measurement issues using a newly installed instrument at the NASA Ames Research Center in Moffett Field, California.

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