Passive Retrievals of Cloud Droplet Number Concentrations

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Abstract.

This proposal describes an investigation that will act as a preliminary proof of concept study to verify the validity of a previously developed theoretical concept. The investigation will attempt to retrieve cloud droplet number concentrations using data from the Research Scanning Polarimeter (RSP). Recently acquired RSP and lidar data will allow for an instrument inter-comparison that will reveal the validity of the approach. The approach involves (1) using polarized and total reflectance to find how much near infra-red light is being absorbed in clouds, (2) determine cloud top pressure from polarized reflectance observations in the deep blue, (3) find cloud physical thickness from the absorption and cloud top pressure retrievals (4) estimate the droplet size distribution from polarized reflectance observations in the rainbow (5) determine the cloud droplet number concentration from the physical thickness and droplet size distribution retrievals.