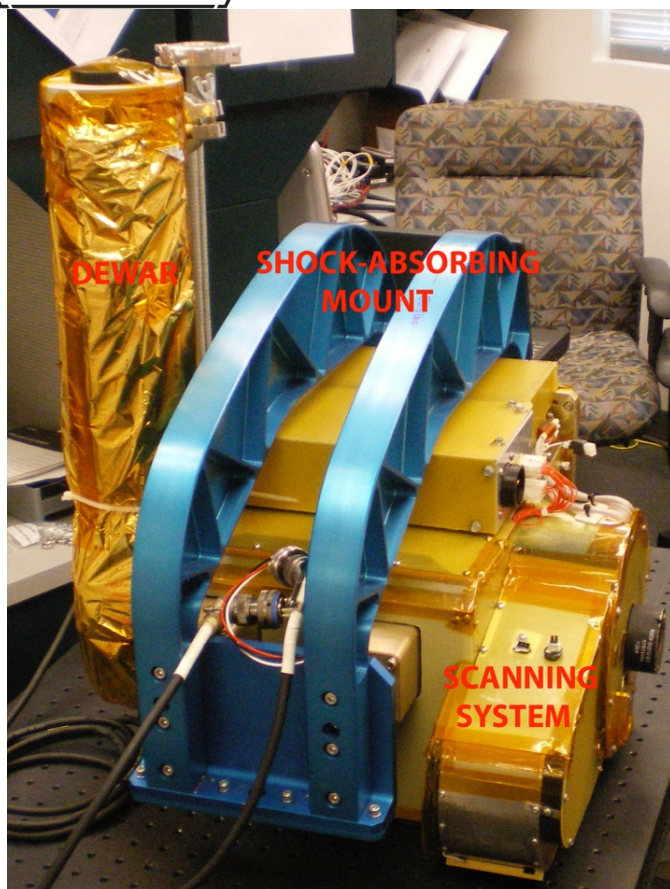


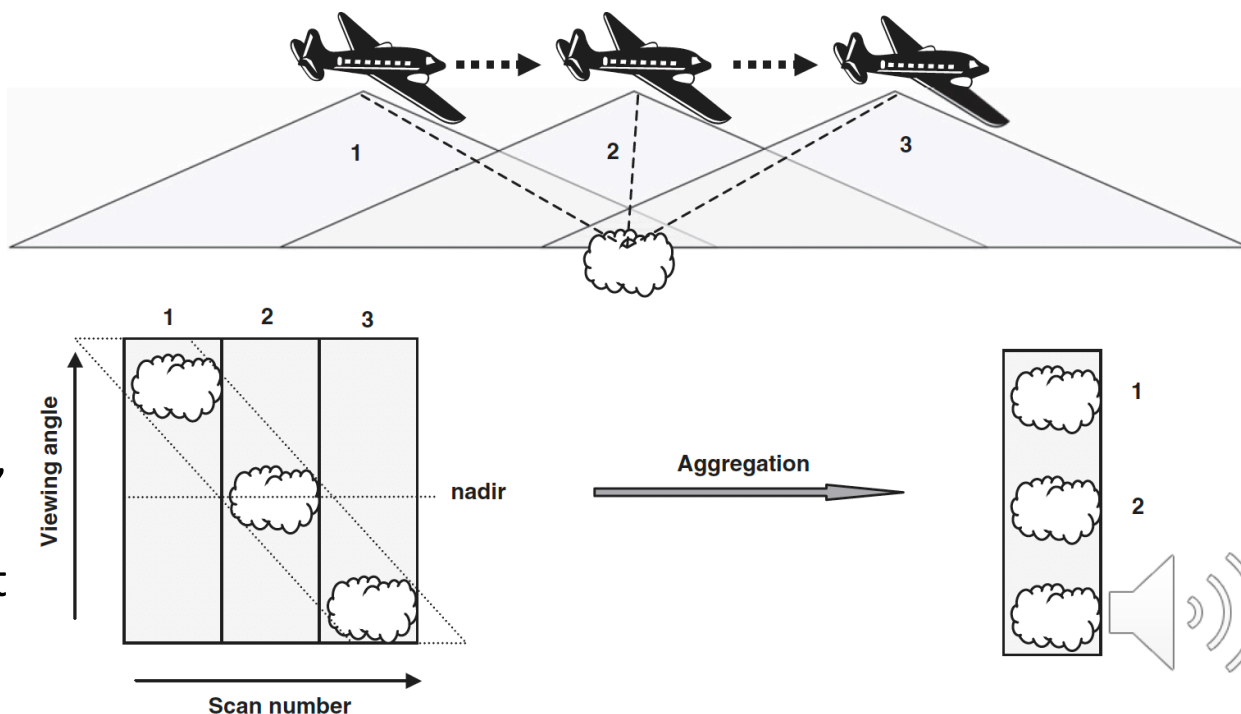


RSP Radiance Data — ACTIVATE-RSP-L1C_UC12_YYYYMMDD_RX



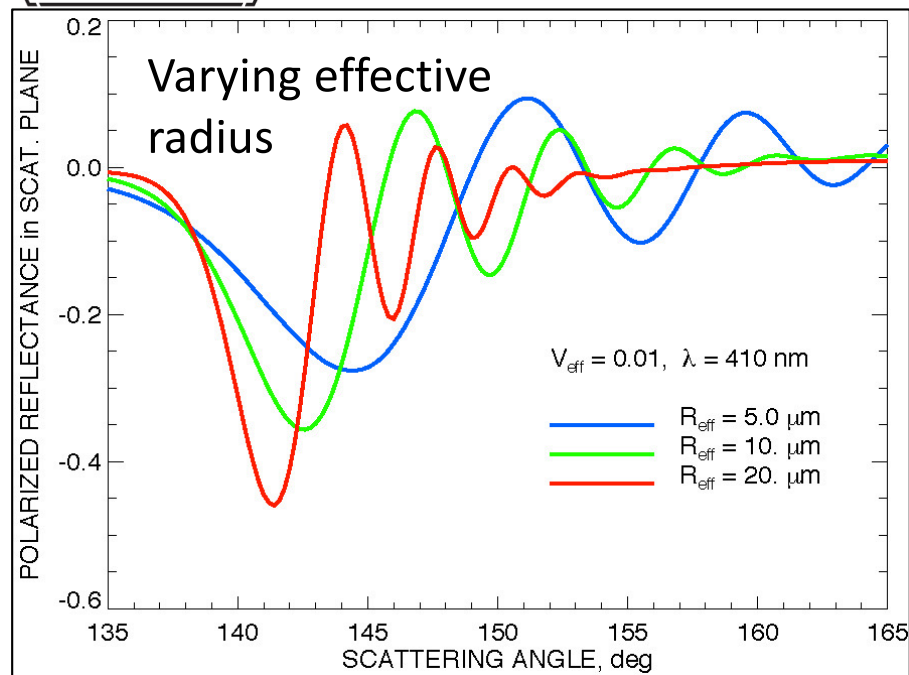
- The Research Scanning Polarimeter (RSP) is a passive, downward-looking polarimeter, with nine spectral bands between 410 and 2260 nm that scans its field of view along the aircraft ground track.

- The RSP scanner rotates continuously so any given scan consists of views of lots of different scenes both in front of, and behind, the aircraft. So, as the aircraft flies over a given point on the surface (or cloud) it will be viewed from multiple angles as shown in the figure below. These multiple views of the same scene are what is contained in the L1C files.
- Radiance and linear polarization measurements over an angular range of $\pm 55^\circ$ from nadir every 0.8° are provided for each scene.

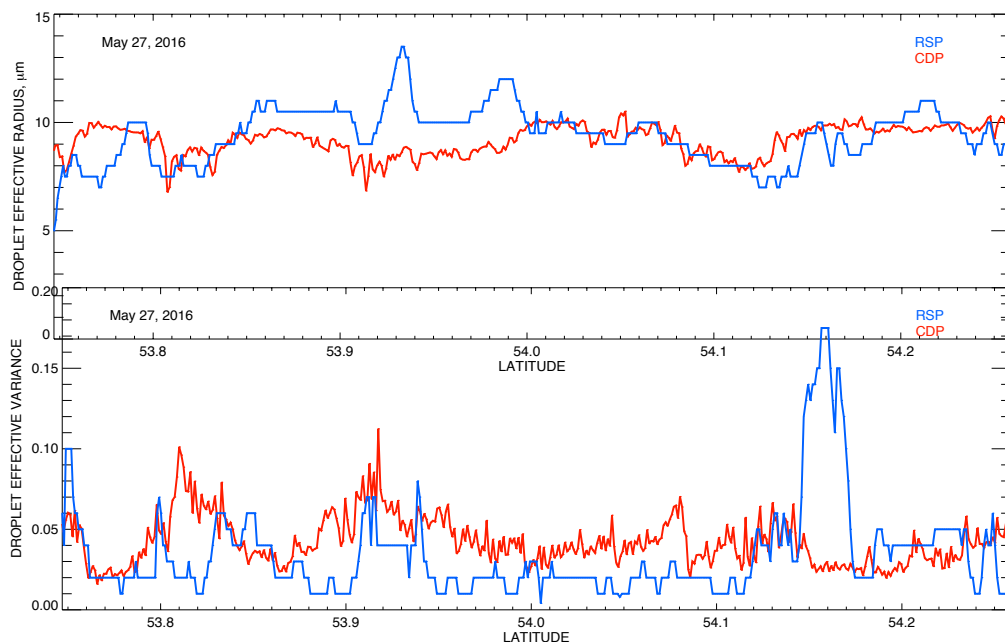




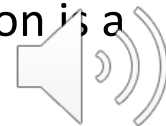
RSP Cloud Data — ACTIVATE-RSP-CLD_UC12_YYYYMMDD_RX



- A feature of the RSP data is that it contains high angular density observations for every scene.
- When a water cloud is present polarized observations of the cloud bow can be used to estimate the Droplet Size Distribution.
- The RSP also has spectral bands in regions where liquid and ice water absorb (1.59 and $2.26 \text{ } \mu\text{m}$) and allow for bispectral retrievals of droplet sizes similar to MODIS and VIIRS.
- The optical depth of the cloud is also estimated using a non/weakly absorbing band at 865 nm

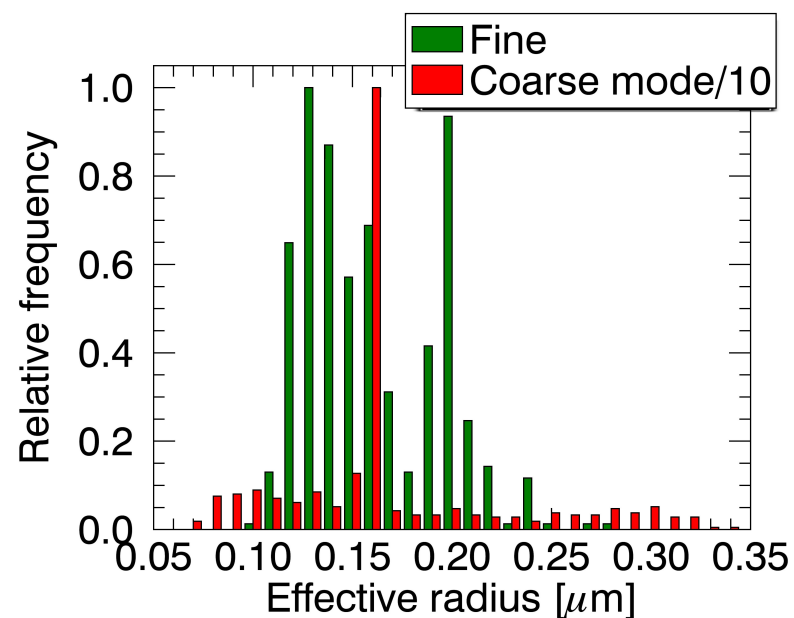
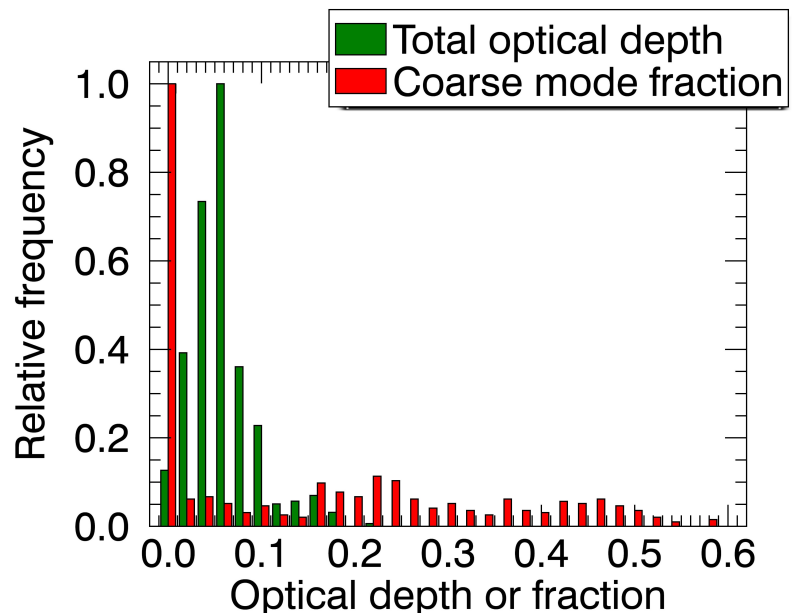


- The remote sensing estimates of droplet size distributions have been validated against in situ observations with an agreement for effective radius $\sim 0.5 \text{ } \mu\text{m}$ and for effective variance of 0.02 between in situ and remote sensing when a monomodal size distribution is a viable fit.





RSP Aerosol Data – ACTIVATE-RSP-AER_UC12_YYYYMMDD_RX



- In clear skies RSP observations are used to retrieve aerosol properties.
- The microphysical properties (effective radius, variance and complex refractive index) of a bimodal aerosol size distribution are estimated.
- In addition, the total optical depth, coarse mode fraction, aerosol layer height, and number concentration of aerosols is determined.
- As part of the aerosol retrieval ocean properties are estimated: Chlorophyll-a concentration, diffuse attenuation, hemispherical backscatter and windspeed.
- README files in pdf format are provided for each data set in the same location as the data:
 - README files provide references and documented retrieval uncertainties
 - Appendices in the README files list document the structure of the data files and list scientific data sets they contain