

# ESA-JAXA Pre-Launch EarthCARE Science and Validation Workshop

13 – 17 November 2023 | ESA-ESRIN, Frascati (Rome), Italy

**EVID: Validate Cloud Profiling Radar on EarthCARE against Aircraft Observations of Cirriform Cloud** 

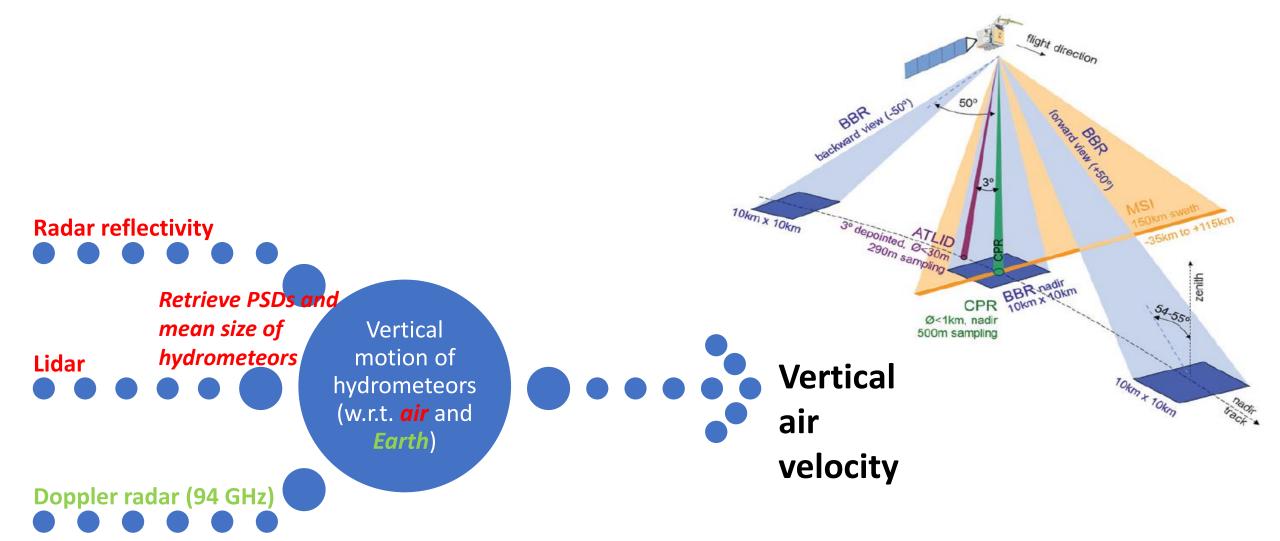
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## BACKGROUND: EARTHCARE SENSING ASCENT







### PROPOSED WORK: METHOD





Compare satellite measurements of cloud-related properties with aircraft data for layer-clouds:

- vertical air velocity
- reflectivity-weighted fall-speed
- cloud-ice and snow contents
- mean sizes of crystals and snow
- corresponding particle size distributions

Assumptions causing biases will be examined

 E.g. precipitation above freezing level assumed to be ice, but really depends on ascent/solid aeros

#### ATLID Level 1b CPR Level 1b MSI Level 1b Radar reflectivity Attenuated TOA radiances for 4 solar channels, TOA backscatter in profile, Doppler Rayleigh channel, velocity profile brightness co- and cross-polar temperatures for 3 thermal channels Mie channels ATLID Level 2a CPR Level 2a MSI Level 2a Feature mask, target Radar reflectivity, Cloud mask, liquid classification, Doppler velocity, and ice cloud extinction, feature mask, cloud properties, cloud backscatter and type, liquid and ice top height, aerosol depol. profiles, cloud properties, properties aerosol properties, vertical motion, rain ice cloud properties and snow estimates 2 and 3 Sensor Synergy Level 2h Synergistic target classification, cloud, aerosol and precipitation properties synergistically retrieved from ATLID, CPR and MSI

**EVID: Validate EarthCARE** 

Illingworth et

al. (2015)

### PROPOSED WORK: SUMMARY



EarthCARE satellite launch date: May 2024

Problem: aircraft field campaigns are only planned 1 or 2 years in advance, and Swedish space agency (SNSA) may fund projects in late 2024

Solution: After launch

- grant application to SNSA
- seek coincident aircraft campaigns

