ACTRIS CCRES

Scanning/non-scanning strategy
Chris Walden

Context

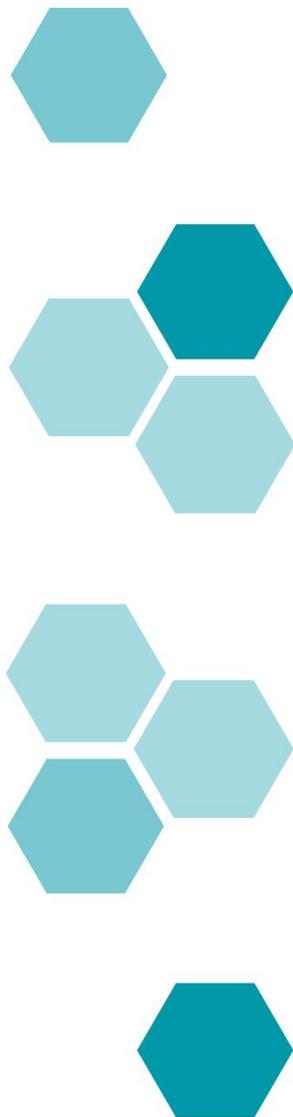**More observational sites starting to acquire instruments with scanning capability**

- Opens up many options for bespoke scan configurations

DCR Scan Modes
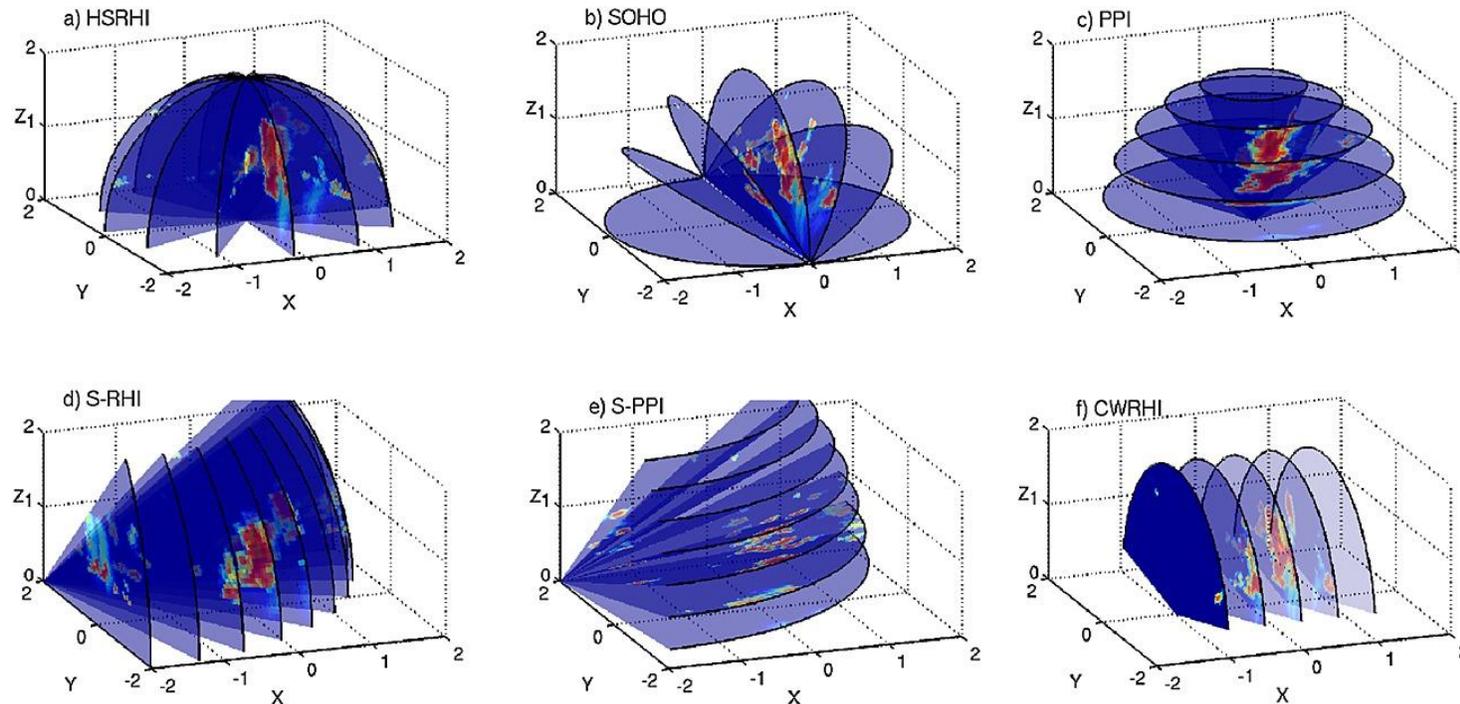
Context

But …

- Scanning sequences can be time consuming
- Diverse options can pose a challenge
  - for ACTRIS QA/QC procedures
  - for the Cloudnet retrieval algorithms which require simultaneous data from multiple instruments.

Need to …

- Balance versatility of scanning against the requirements for delivering robust cloud profiling data products at each NF.

Instruments with scanning capability

- **Doppler cloud radar**

  - Azimuth and elevation scanning

    - MIRA-35 with full hemispheric scanning antenna

    - RPG 94GHz or 35GHz FMCW radars mounted in positioner

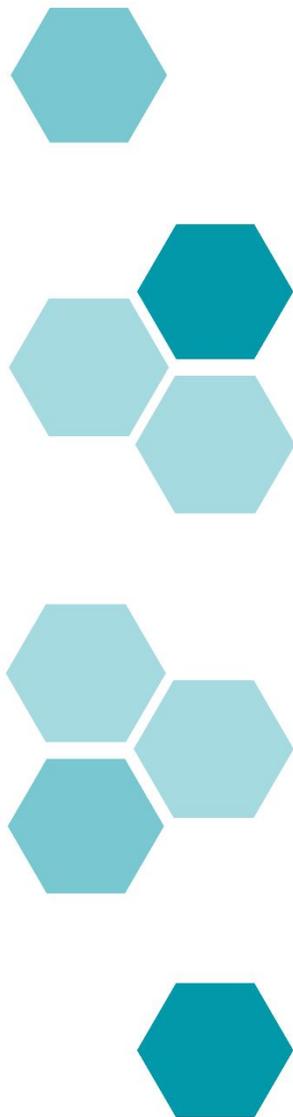   - 95GHz BASTA mini mounted in positioner

    - …

    Different limits on available scanning rates (deg/sec) – and hence selection of appropriate scan sequences.

- **Microwave radiometer**

  - Elevation scanning

  - Azimuth scanning mounts exist but not in widespread use

- **Doppler lidar**

  - Scanning capability is a key feature

Things to establish

Need to draft guidelines for

- **When not to scan** – preserving multi-instrument vertical pointing observation periods required by Cloudnet processing

- **When to scan** – coordination of scanning across multiple instruments to optimise vertical dwell scheduling
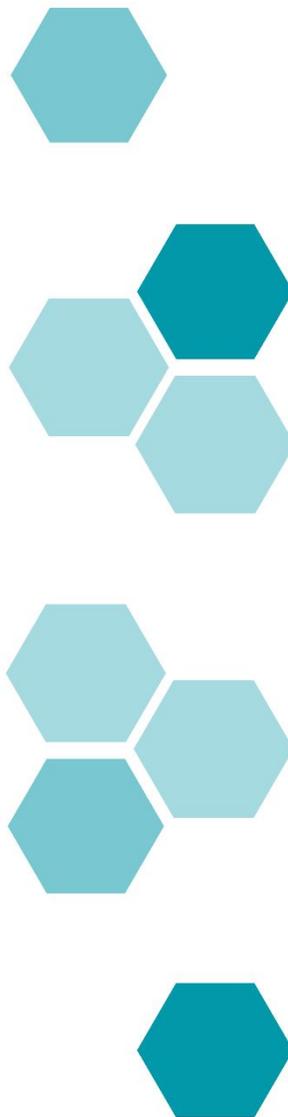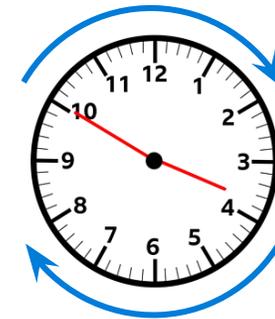
When not to scan

For ACTRIS Cloud Remote Sensing NFs

Guiding principle is

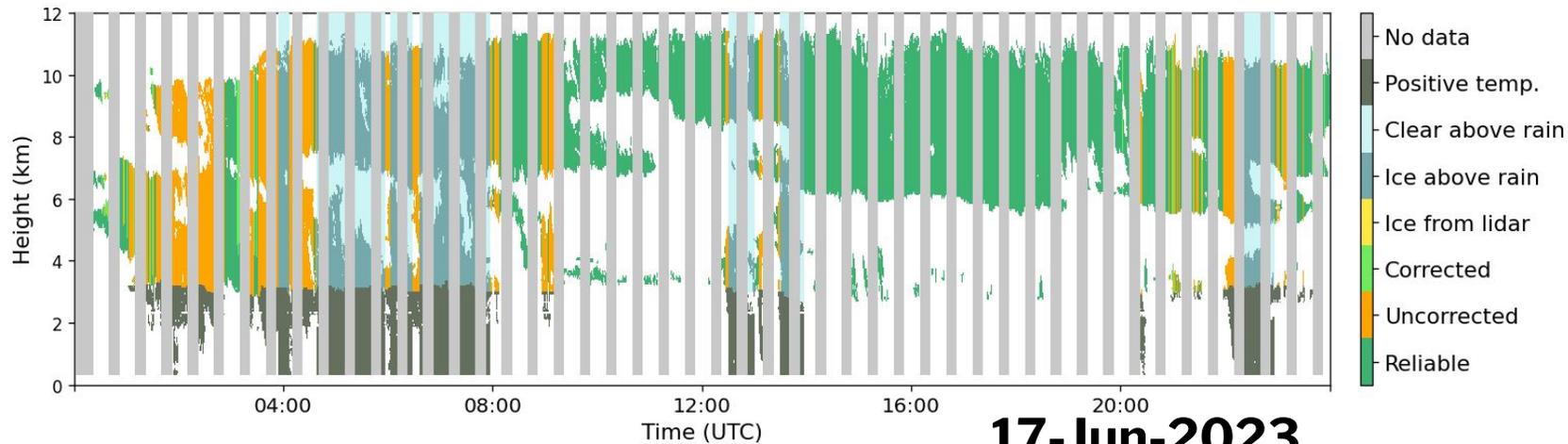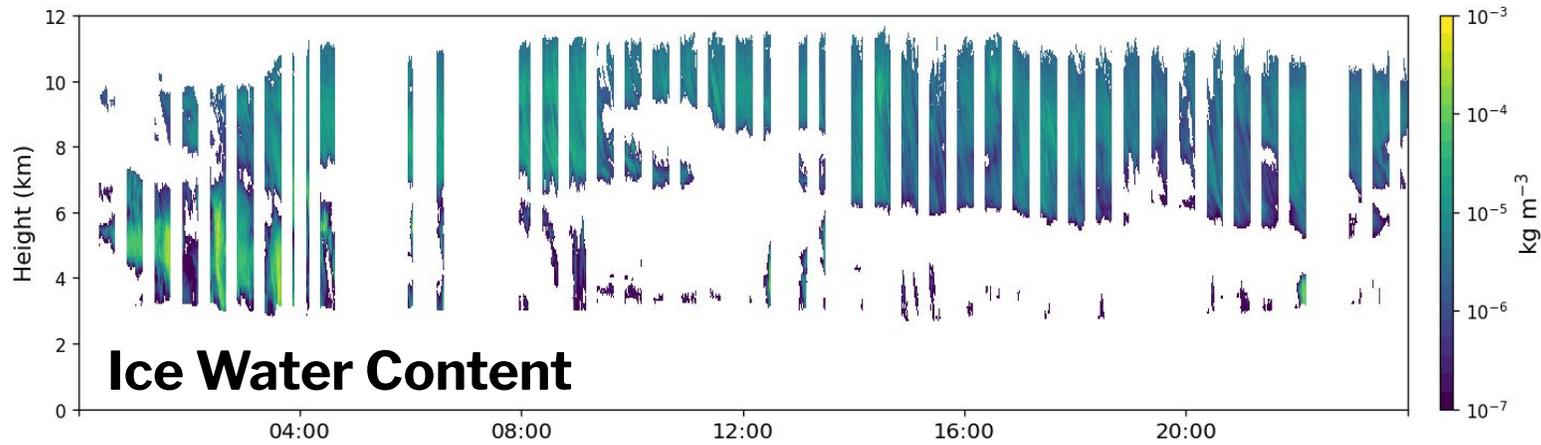- Minimum 50% zenith-pointing observations per hour

Considerations:

- Duration of contiguous dwells – sufficient for model intercomparison

- Scheduling of zenith dwells

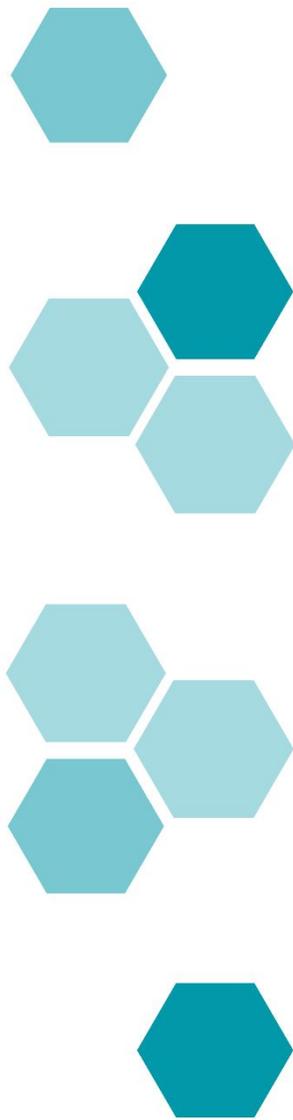 (e.g. 20min dwells centred on the clock hour/half-hour)

Example: UK WesCon campaign 2023

- 18 min dwells centred on clock hour and half-hour
- Scanning: HSRHI + VAD + Boundary Layer PPI stack

Ice Water Content

17-Jun-2023

Discussion

Inputs needed

- Science drivers for scanning configurations (or off-zenith dwells)
  - Including requirements from linked networks such as E-PROFILE

- Other drivers for scanning configurations (QA/QC or calibration benefits)
  Examples include
  - radar solar scans for antenna pointing
  - wind profiling VAD scans 8 deg off zenith.

- Benefits/drawbacks of coordinating multiple instrument scanning

Thank you