RainGain Project Meeting:
High Resolution Rainfall Rate Estimation and Forecast

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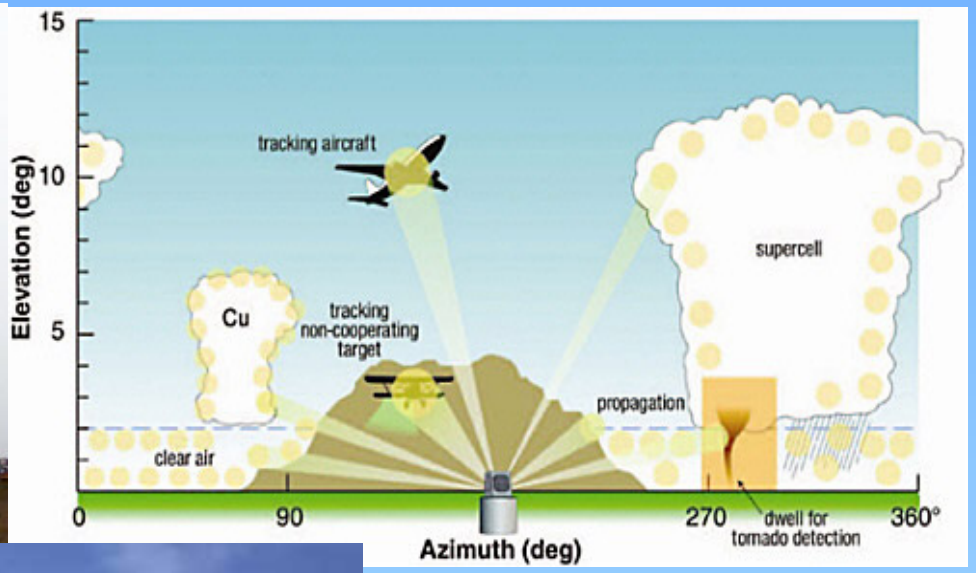
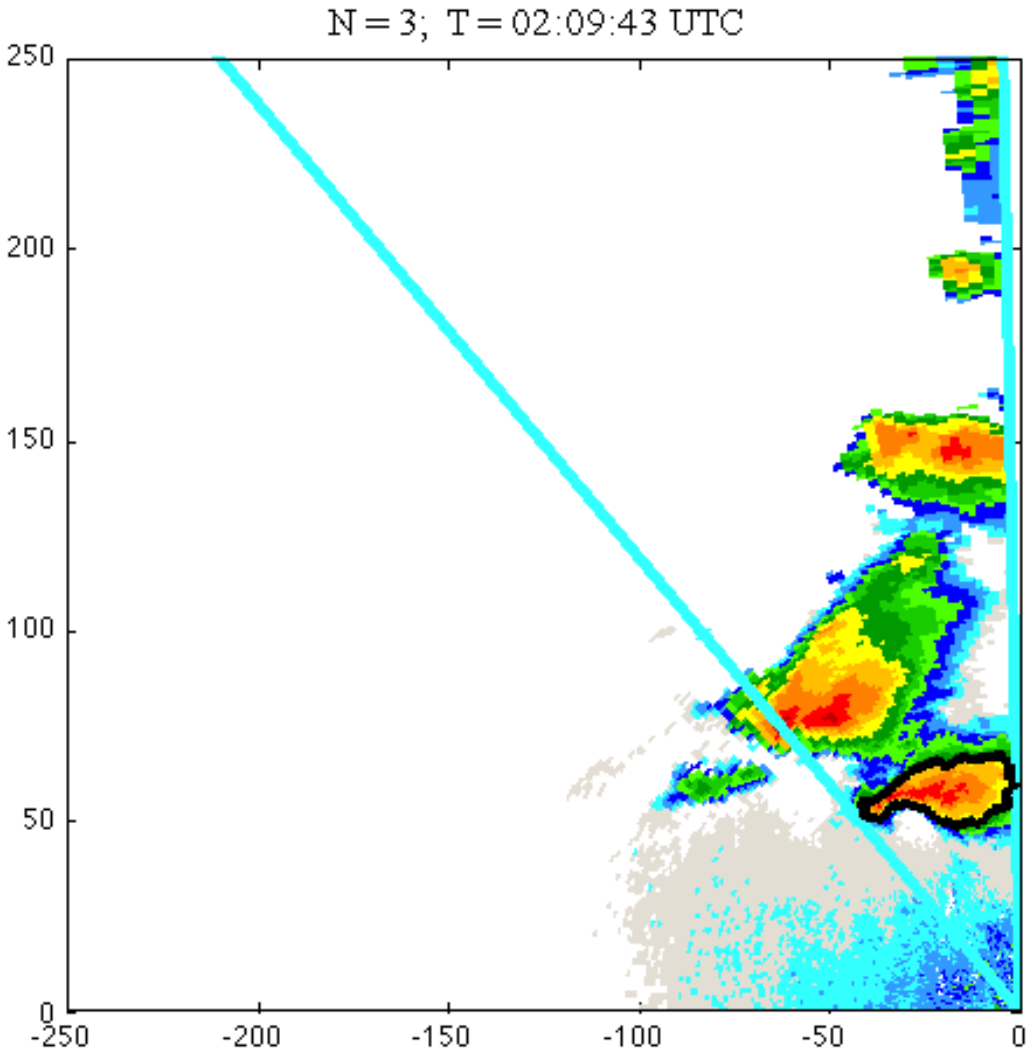
Where do I come from?

Master work at The University of Oklahoma, USA



Master work at The University of Oklahoma, USA



Coming to the Netherlands (6 months ago)

PhD work at TUDelft, NL

High resolution rainfall rate estimation and forecast:

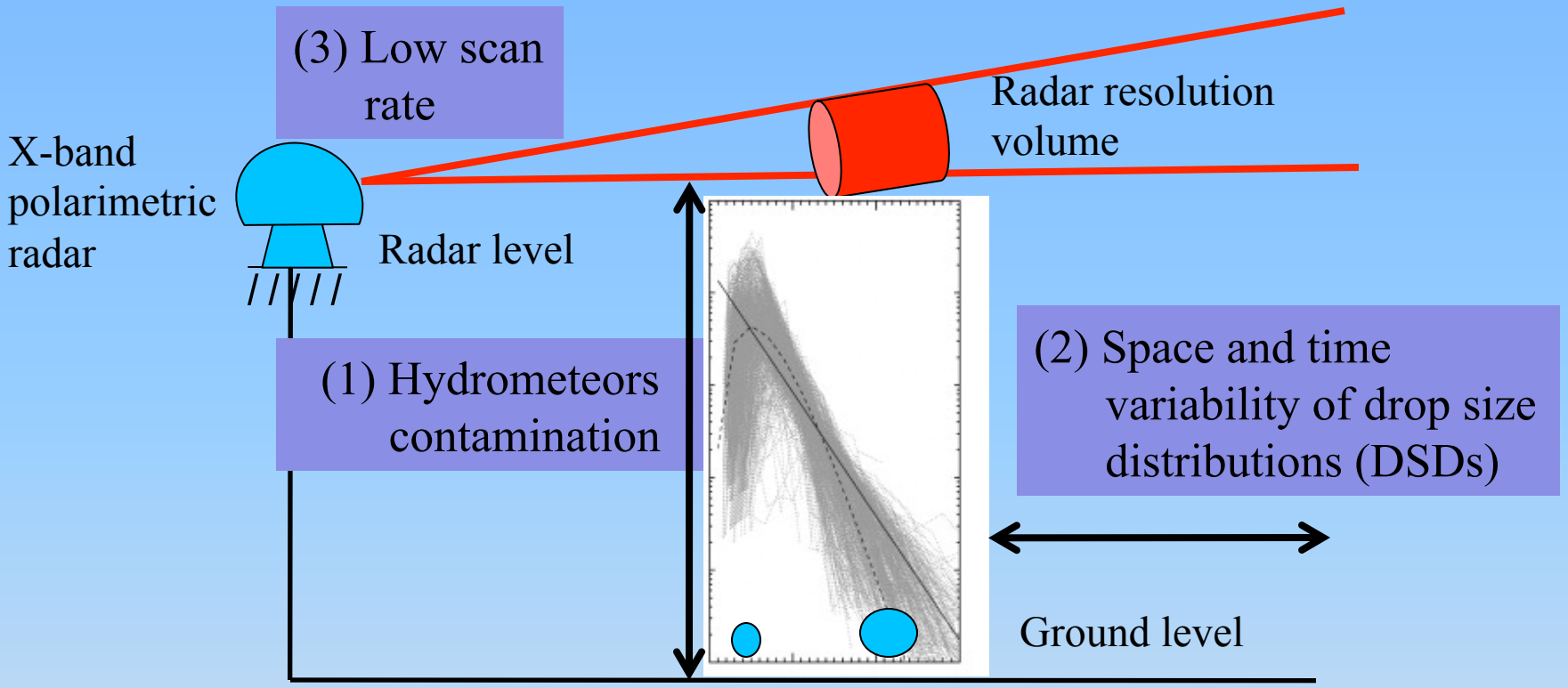
WP1 & WP2

PhD work at TUDelft, NL

- Develop an novel procedure to estimate and forecast accurate rainfall rate (R) at urban scale in Rotterdam city.
- Operate the new X-band polarimetric weather radar and possibly others sensing instruments.

Foreseen Issues

Estimation of rainfall rate is not straightforward

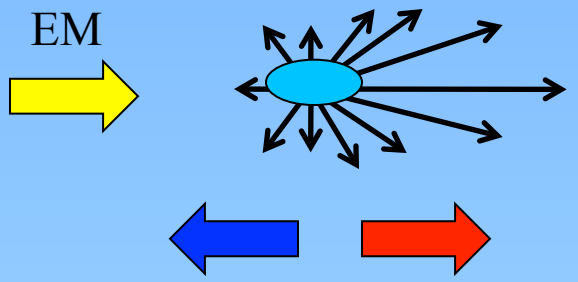


(1) Hydrometeors contamination

How to distinguish rain among others hydrometeors?

Characterizing physical and electromagnetic properties:

- Shape,
- Size,
- Temperature
- Electric energy
- Wave scattering



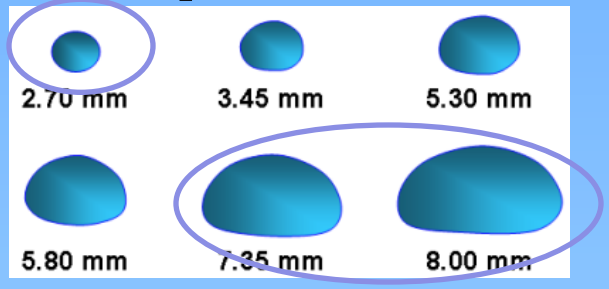
of the following hydrometeors:

- Raindrops,
- Ice, and
- Mixtures (water, ice, air)

at X-band frequency (~10GHz).

(1) Hydrometeors contamination

- Raindrops



How to characterize raindrops?

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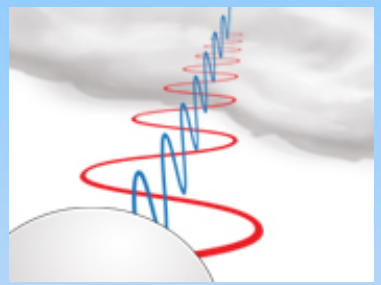
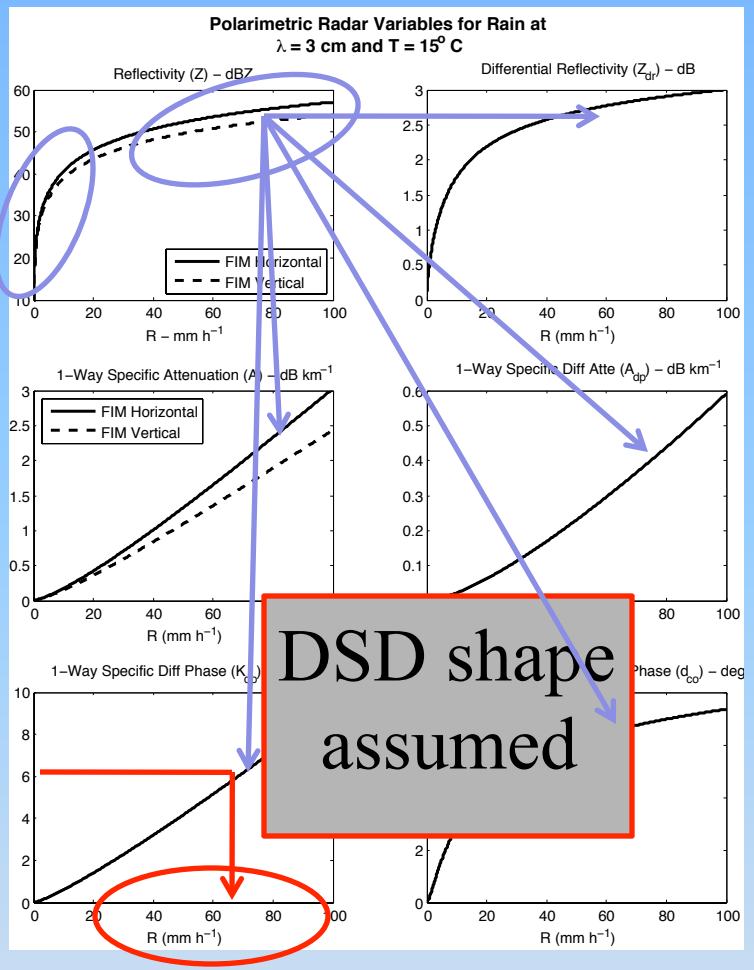
Polarimetric radar variables (theoretical)

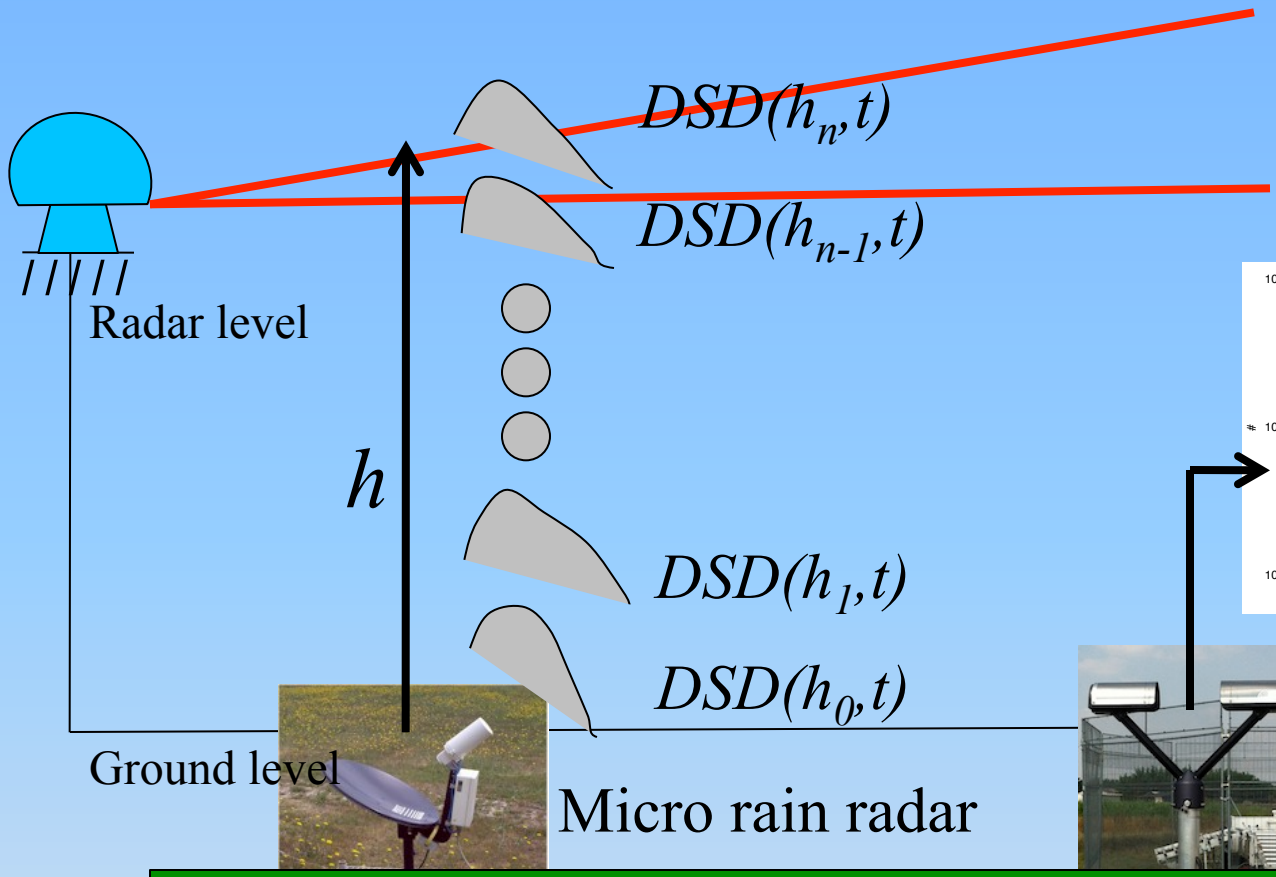


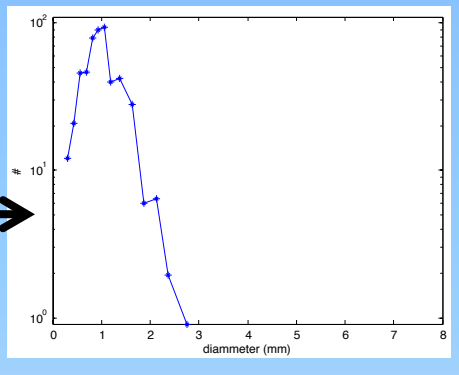
- Ice (hailstones)
- Mix (bright band)

Polarimetric variables vs. Rainfall rate



(2) Space and time variability of drop size distributions (DSDs)

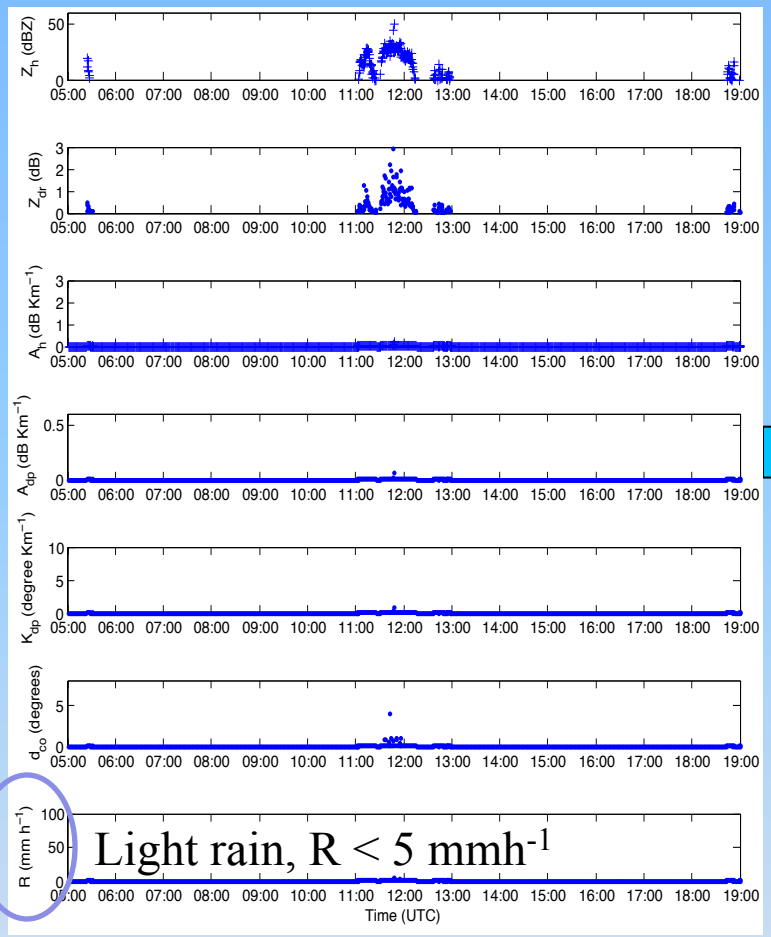


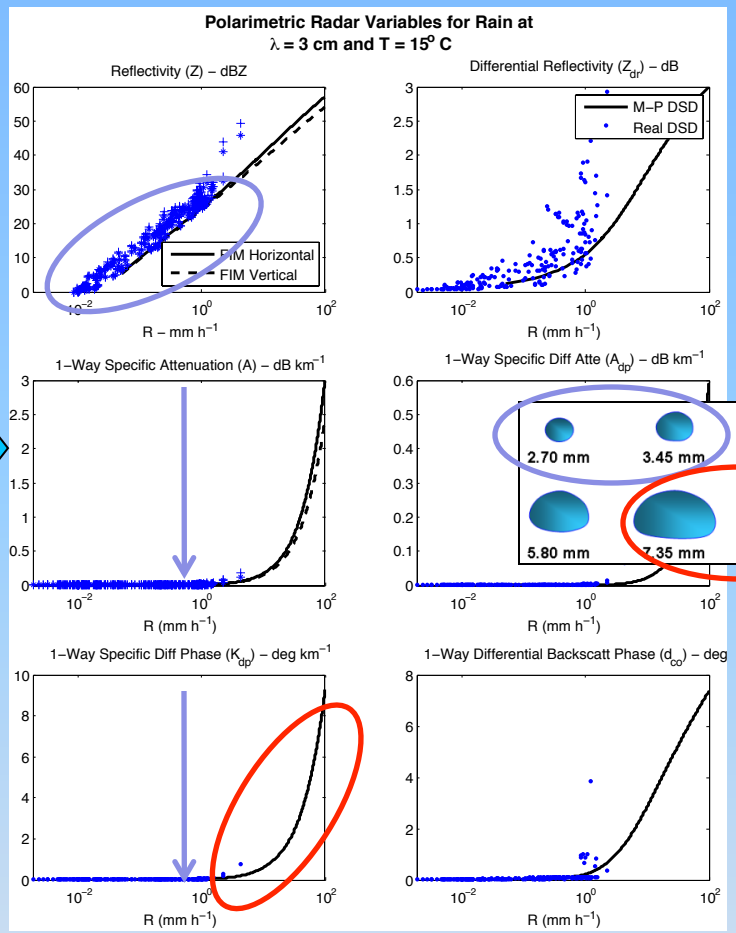


How does DSD variability impact on rainfall rate estimation and forecast at ground level?

(2) Space and time variability of drop size distributions (DSDs)

HyMex facility: Parsivel data

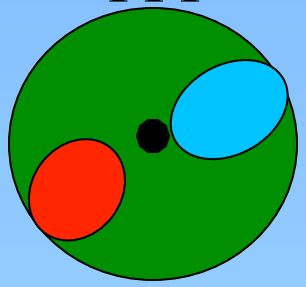




(3) Low scan rate

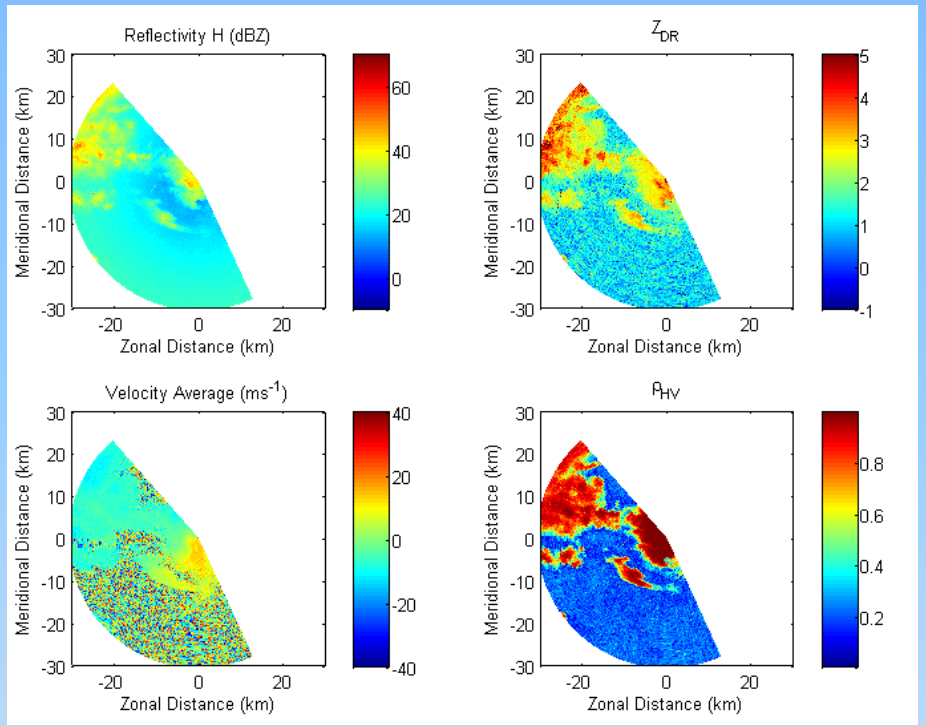
Conventional scanning (360º)

PPI



How to increase scan rate?

Sector scanning



Open Plan

✓Use facilities of Cesar Observatory and HyMex as testbeds for Rotterdam radar.

✓Continue previous work (DSD and Rainfall rate retrievals) from Tobias Otto and Herman Russchenberg.

✓Partners cooperation.