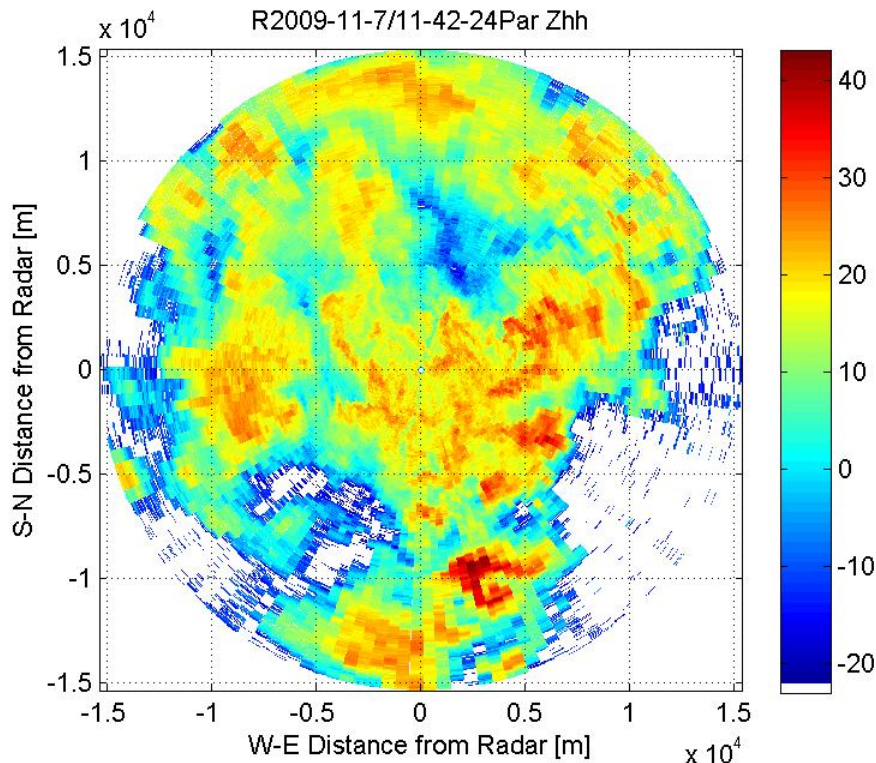


IDRA, IRCTR Drizzle Radar: A High Resolution FMCW X-band Doppler Polarimetric Weather Radar



Jordi Figueras i Ventura



IDRA: IRCTR Drizzle Radar

- Objective: Observation of the detailed spatial and temporal distribution of rainfall and drizzle

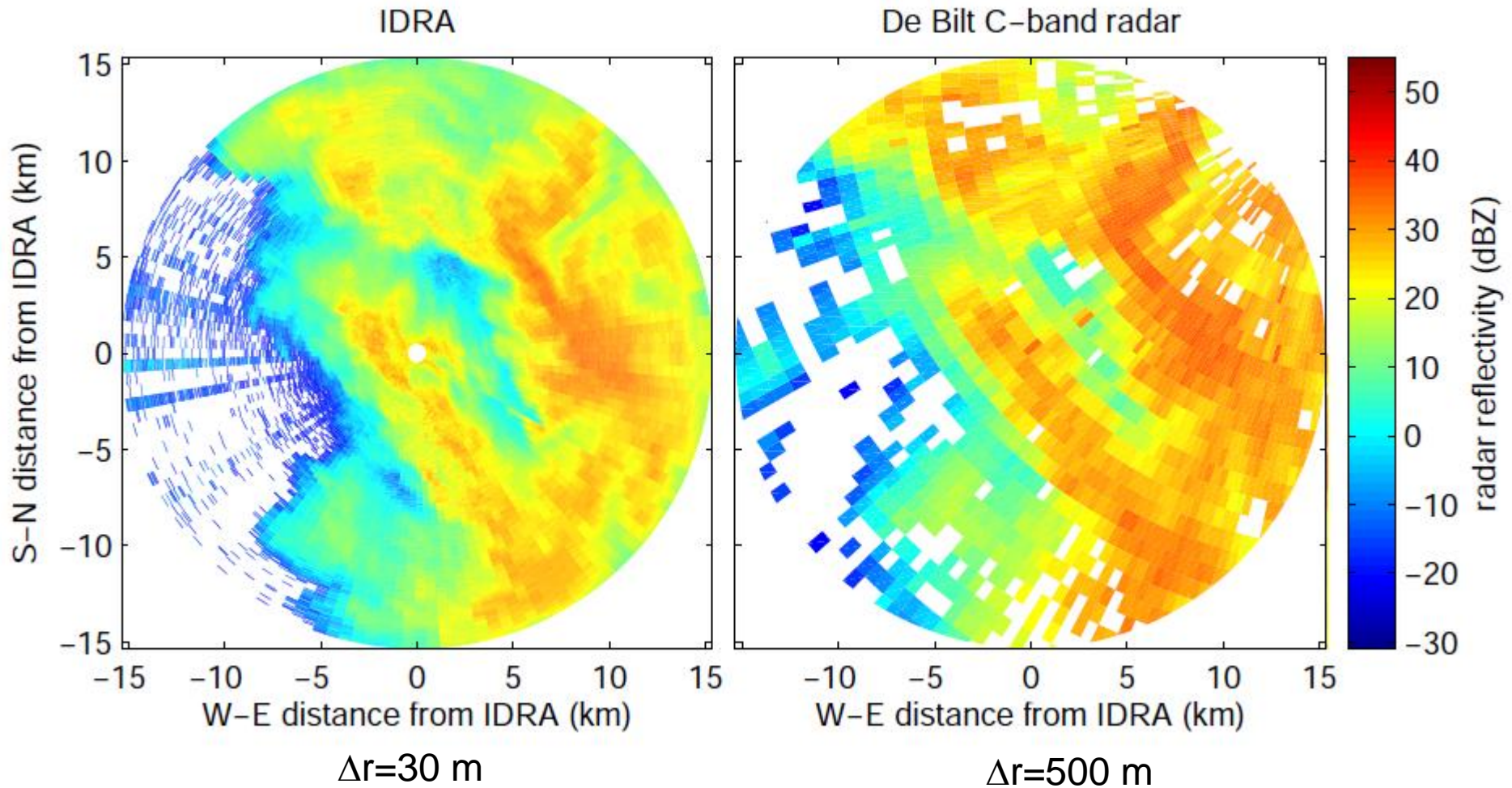
Drizzle: Fairly uniform precipitation composed exclusively of fine drops of water of diameter less than 0.5 mm

- Shape: \approx sphere
- Formed in low altitude clouds: 0 to 1500 m
- Wind speed: 2 to 7 m/s (USA studies)
- Reflectivity (min.): **-15 dBZ**

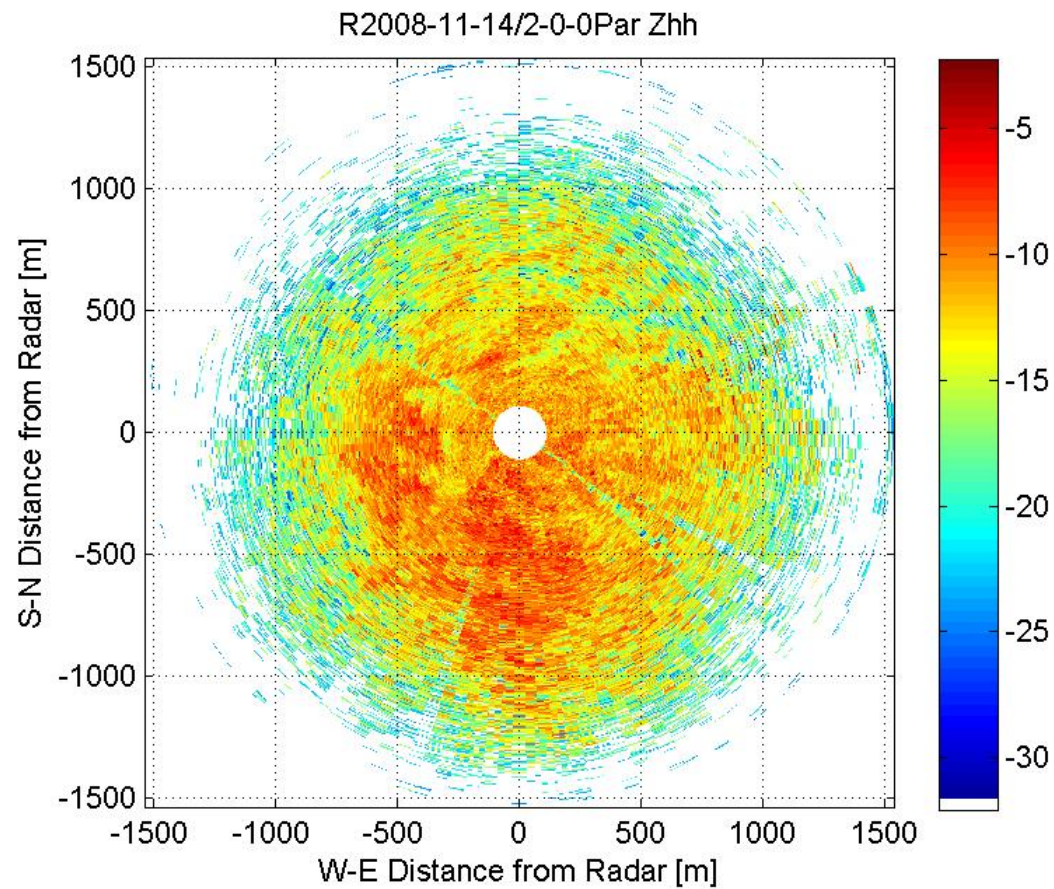
System Specifications

Radar Type	Tower-based horizontal scanning Doppler polarimetric FM-CW
Polarization	Fully polarimetric (HH, VV, HV)
Modulation	Sawtooth/Arbitrary
Transmitted Power [W]	20 max. (selectable in 0.25 dB steps)
Centre Frequency [GHz]	9.475
Max. Doppler Velocity [m/s]	User selectable 19 (mono-modal)/9.5 (polarimetric)
Maximum Range [km]	User selectable 15 (Normal Mode)/1.5 (High resolution mode)
Azimuth Resolution [°]	1.8
Range resolution [m]	User selectable 30 (normal mode)/3 (High resolution mode)
Sweep rate [Hz]	9765.625, 4882.8125, 2441.40625 (Normal), 1220.703125, 610.3515625, 305.1757813
Number of range cells	128, 256, 512 (Normal), 1024, 2048, 4096
Frequency sweep [MHz]	5 to 50
Zmin [dBZ]	-15 at 15 km
Data Flow [MBps/ch]	5 (4 channels)

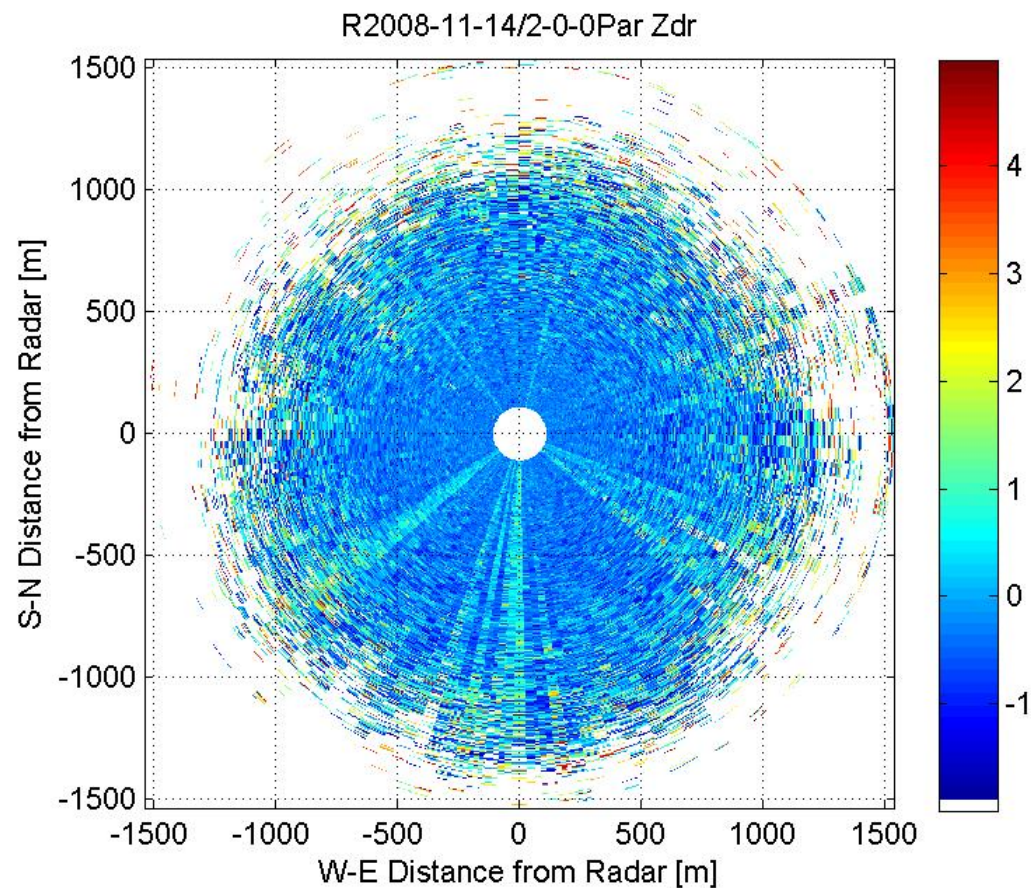
Example: Rain



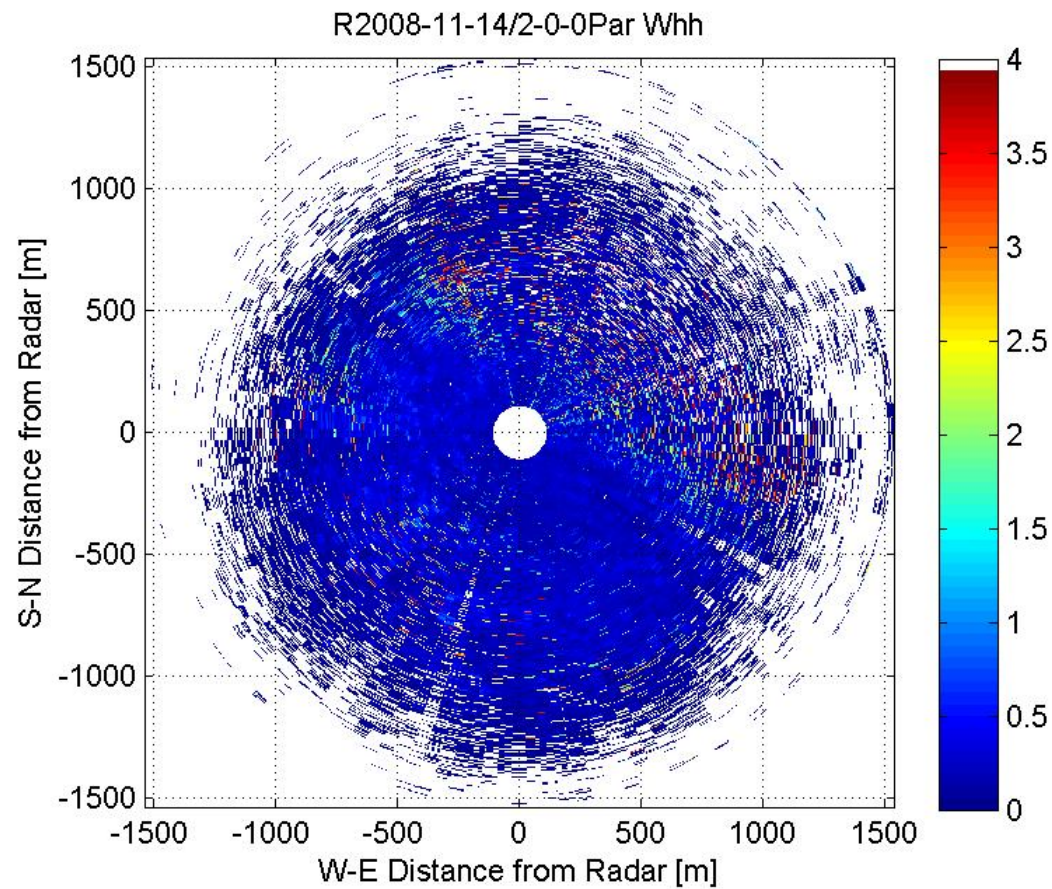
Example: Drizzle



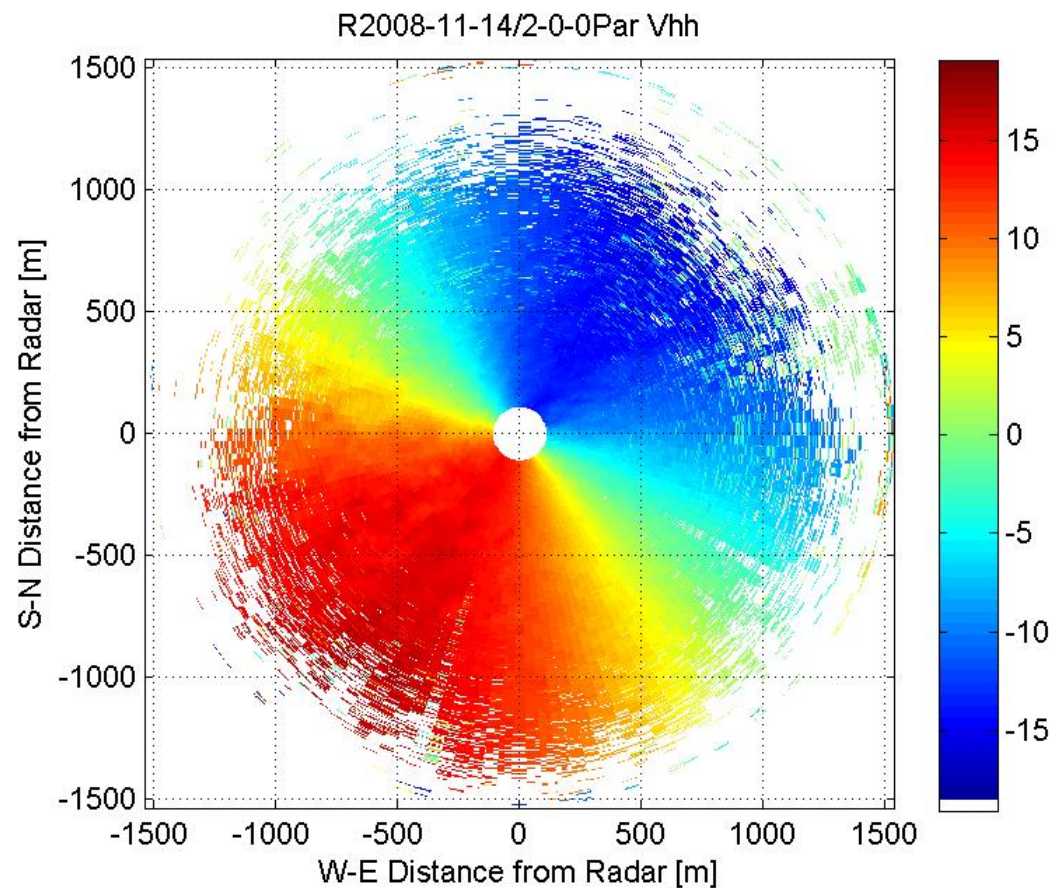
Example: Drizzle



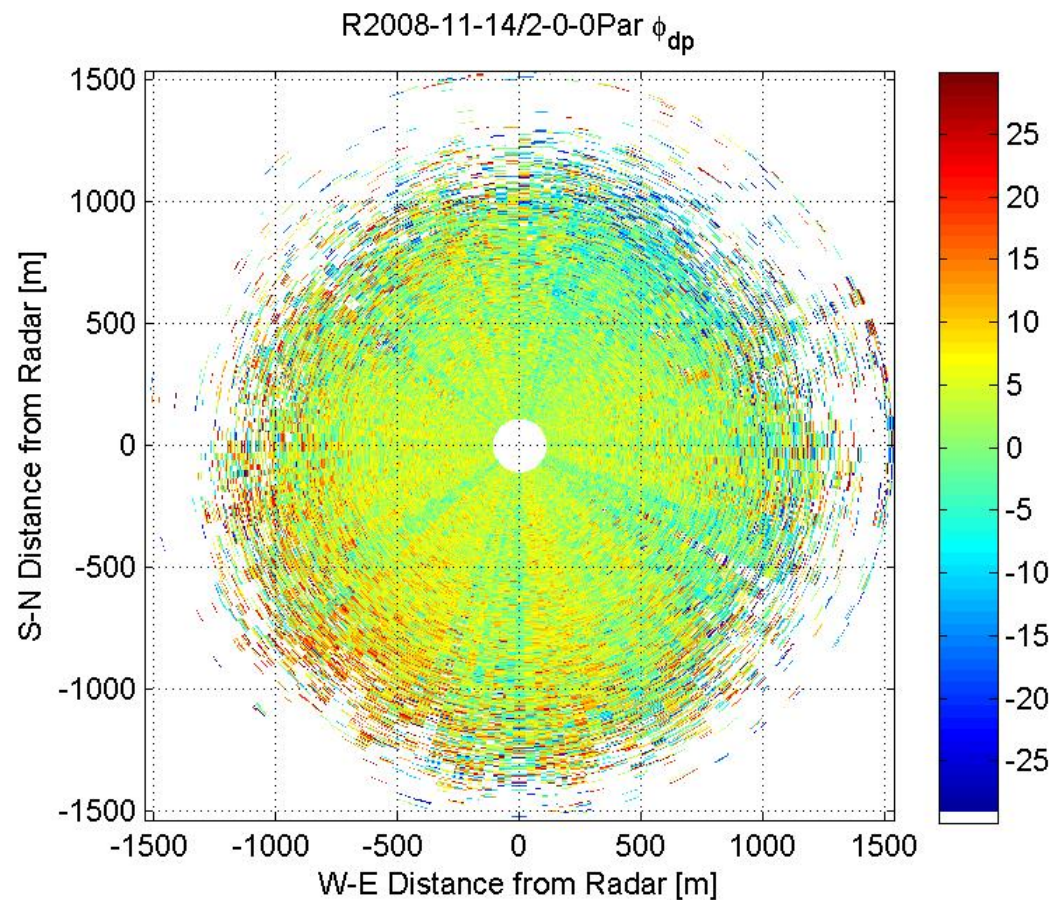
Example: Drizzle



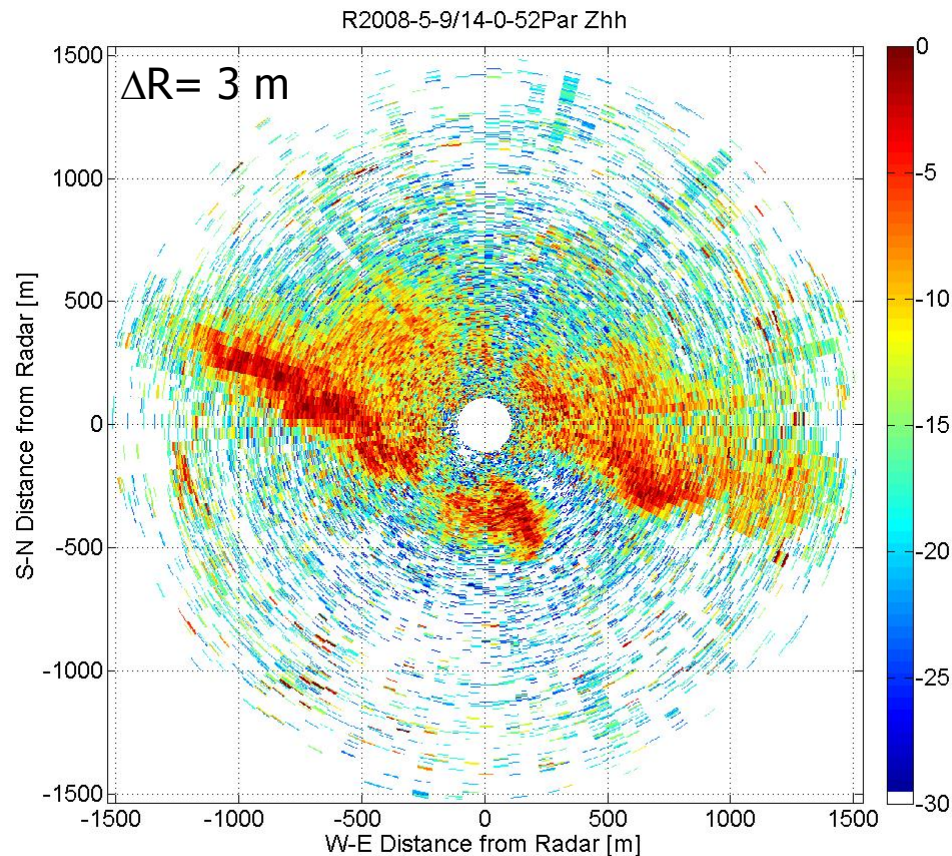
Example: Drizzle



Example: Drizzle

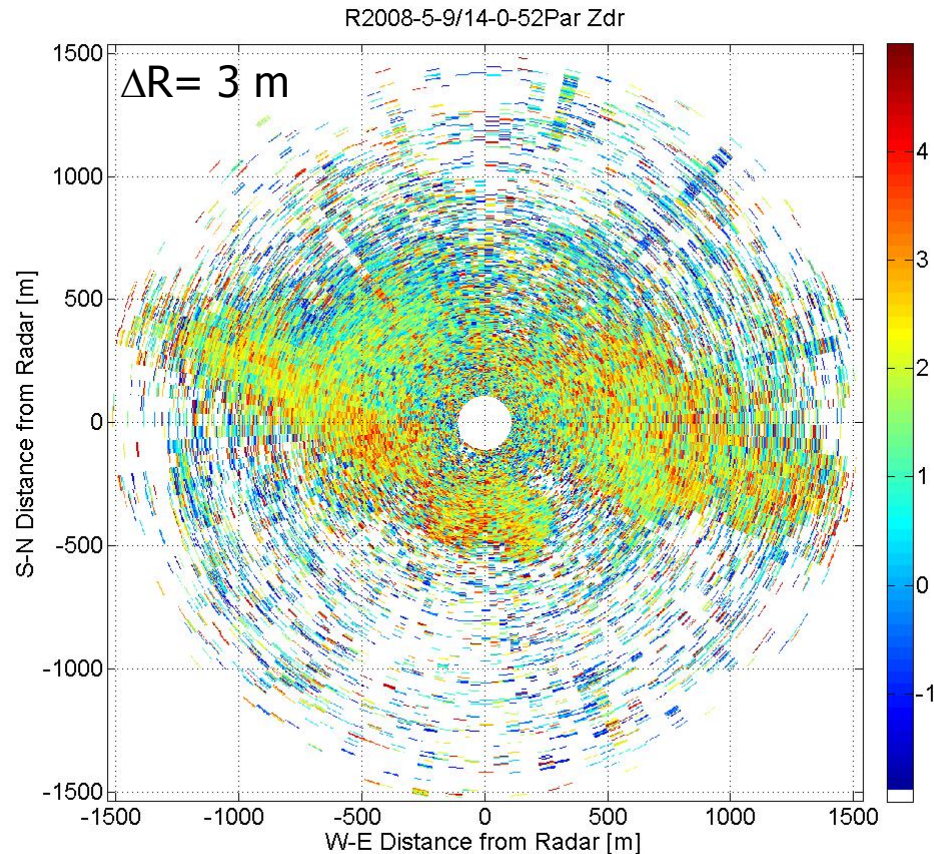


Example: Clear air



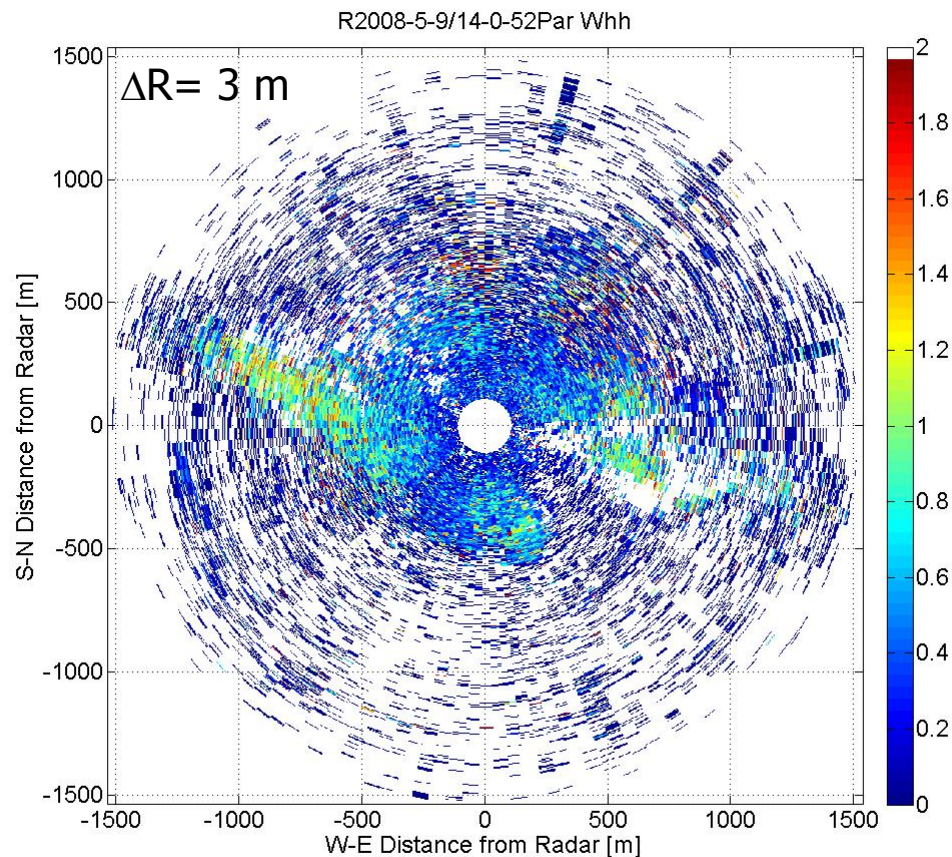
$V_{\text{wind}}(\text{av}) = 6.42 \text{ m/s}$
 $V_{\text{wind}}(\text{max}) = 7.94 \text{ m/s}$
 $D_{\text{wind}} = 103.5 \text{ Deg.}$

Example: Clear air



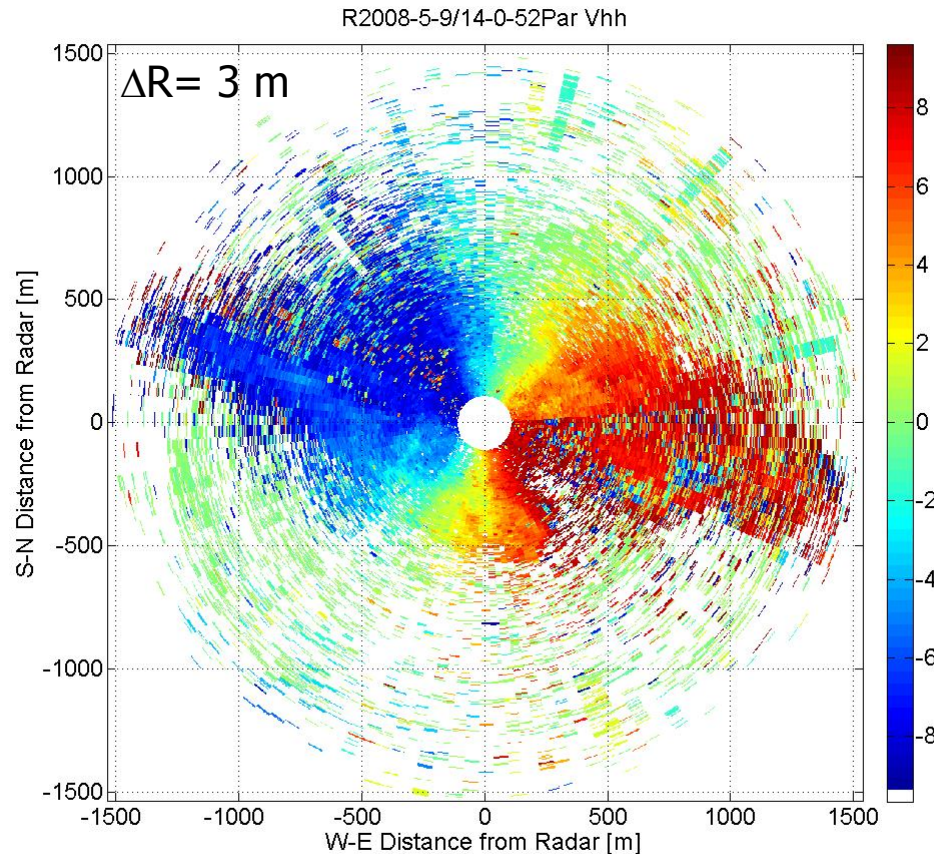
$V_{\text{wind}}(\text{av}) = 6.42 \text{ m/s}$
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Example: Clear air



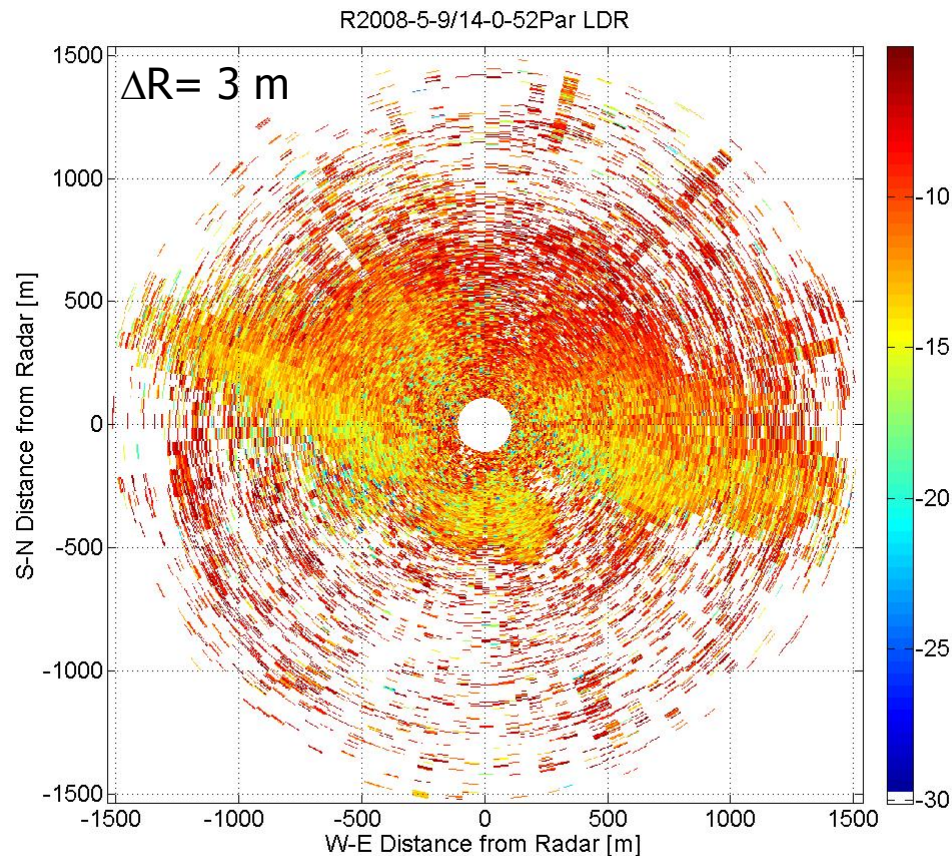
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Thank you

Data FREELY available on demand for scientific purposes!

www.atmos.irctr.tudelft.nl

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