Radar Quality Control and Quantitative Precipitation Estimation Intercomparison Project Status

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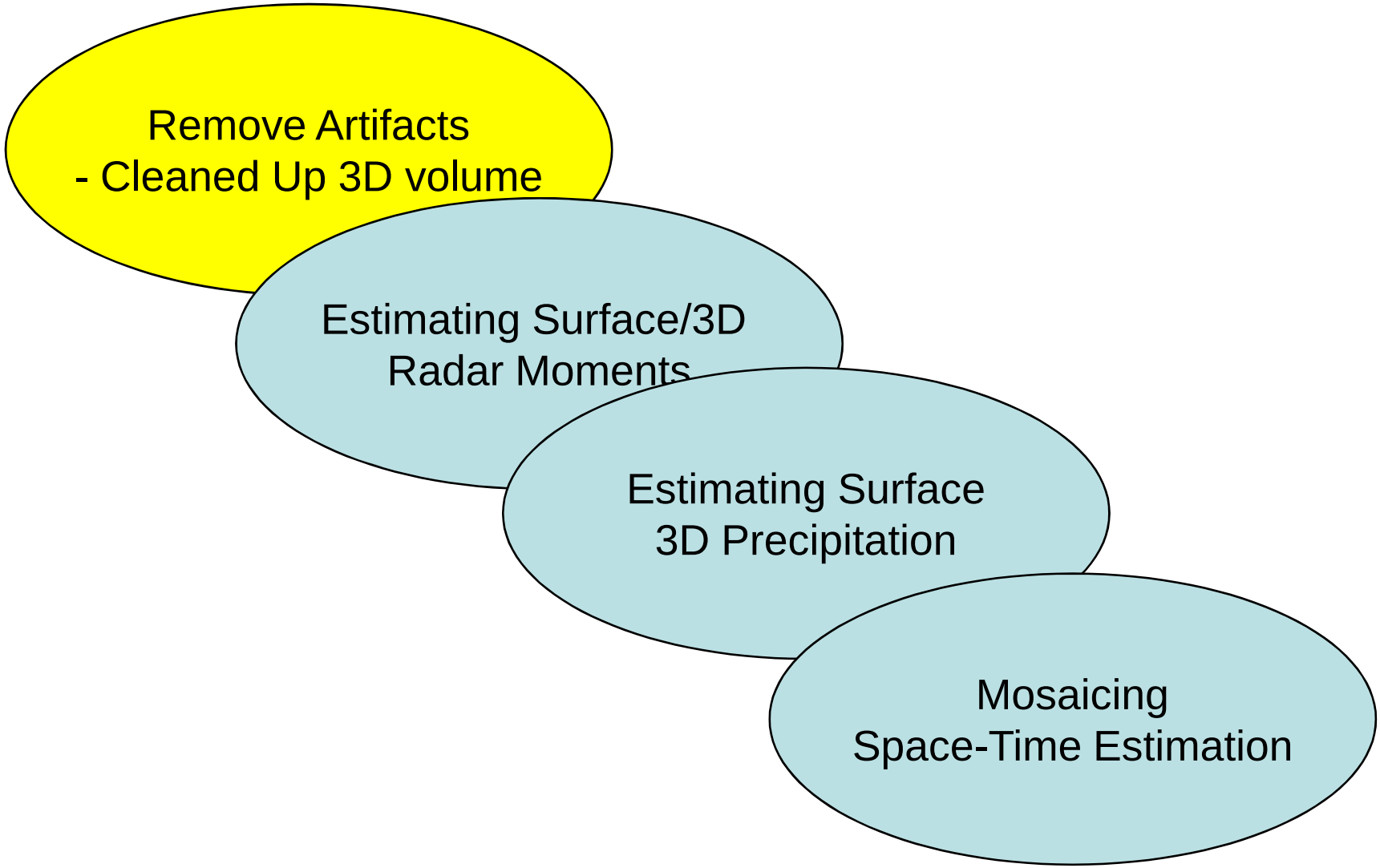
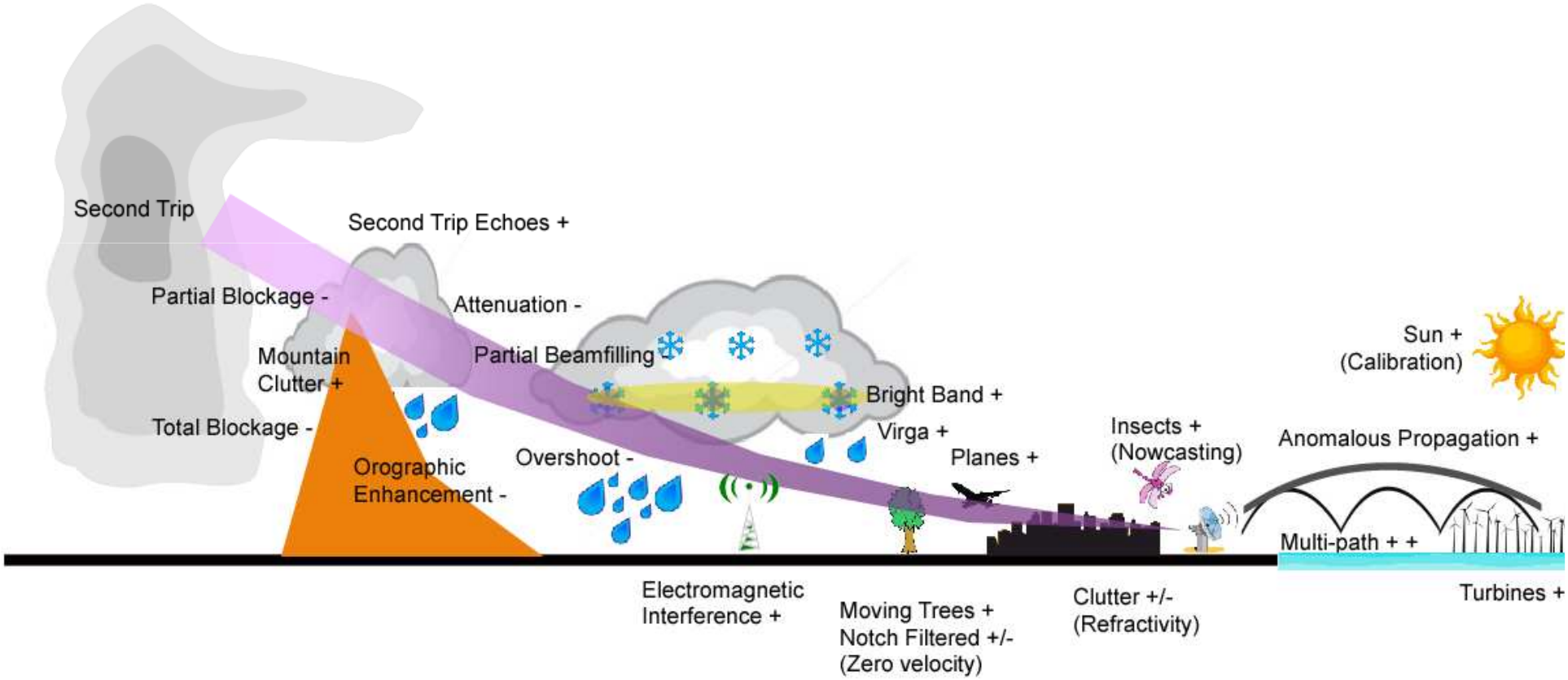
Radar DQ is not just about QPE

- Nowcasting
  - Non-precipitating echoes/insects
  - Data Classification
- Radar Data for NWP
  - Reflectivity, radial velocity assimilation
  - VAD Winds

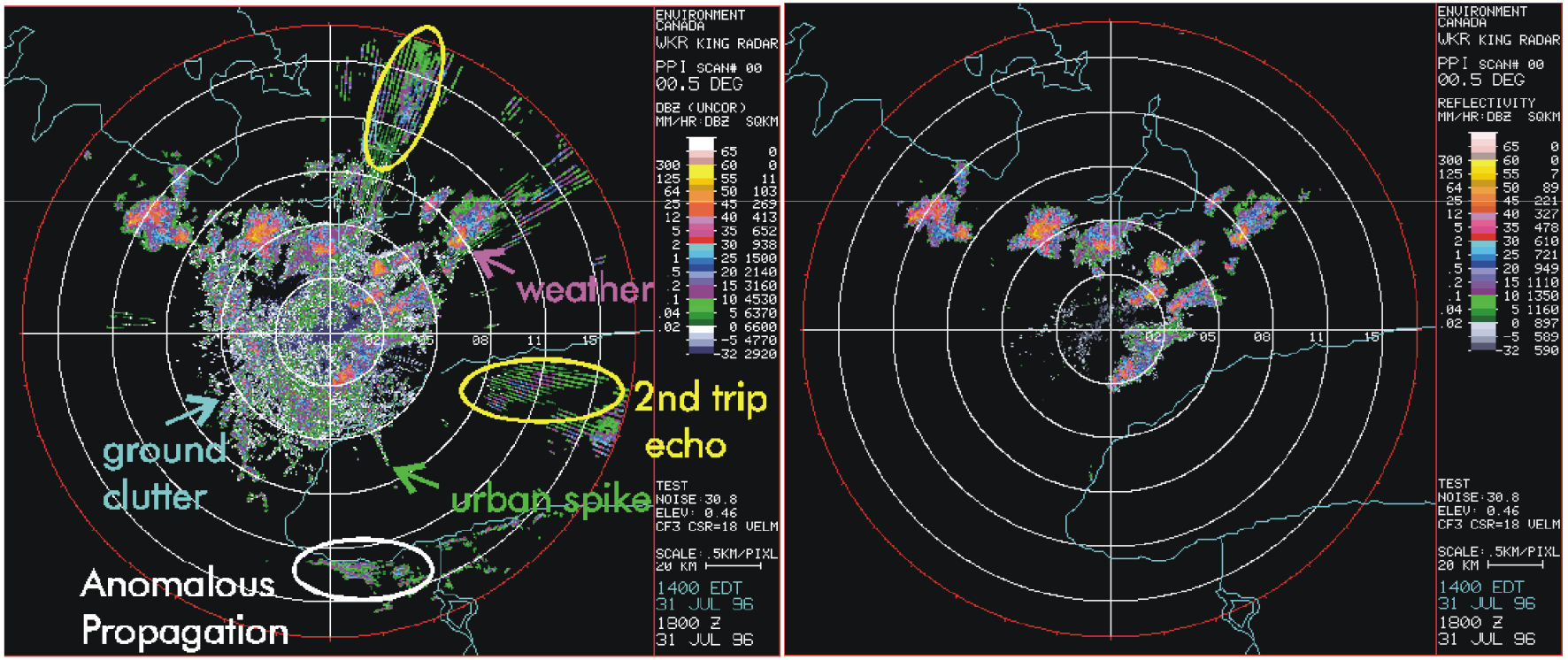
Segmenting the DQ Process



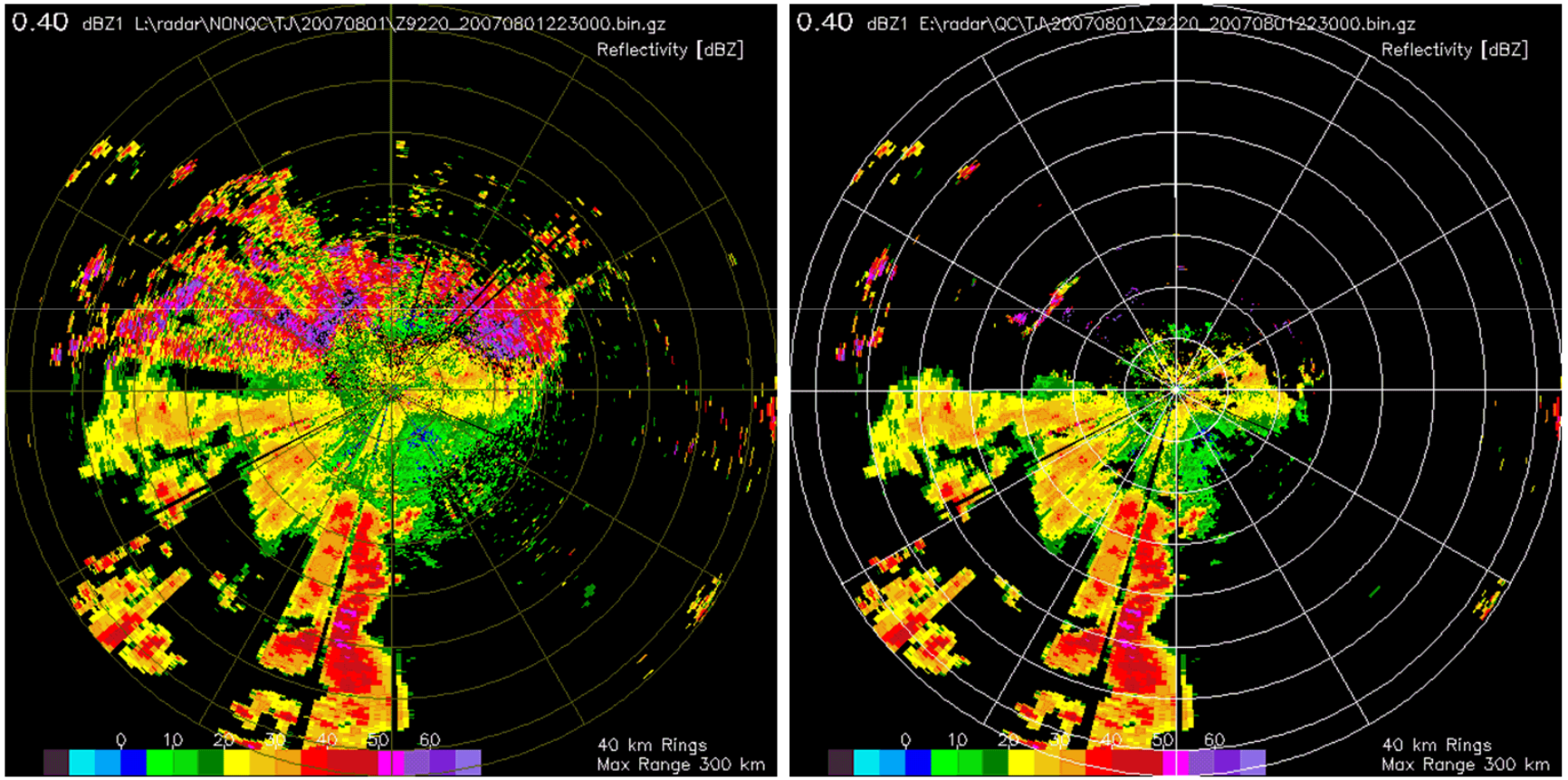
First Intercomparison will assess artifact correction algorithms



Doppler Filtering is popular



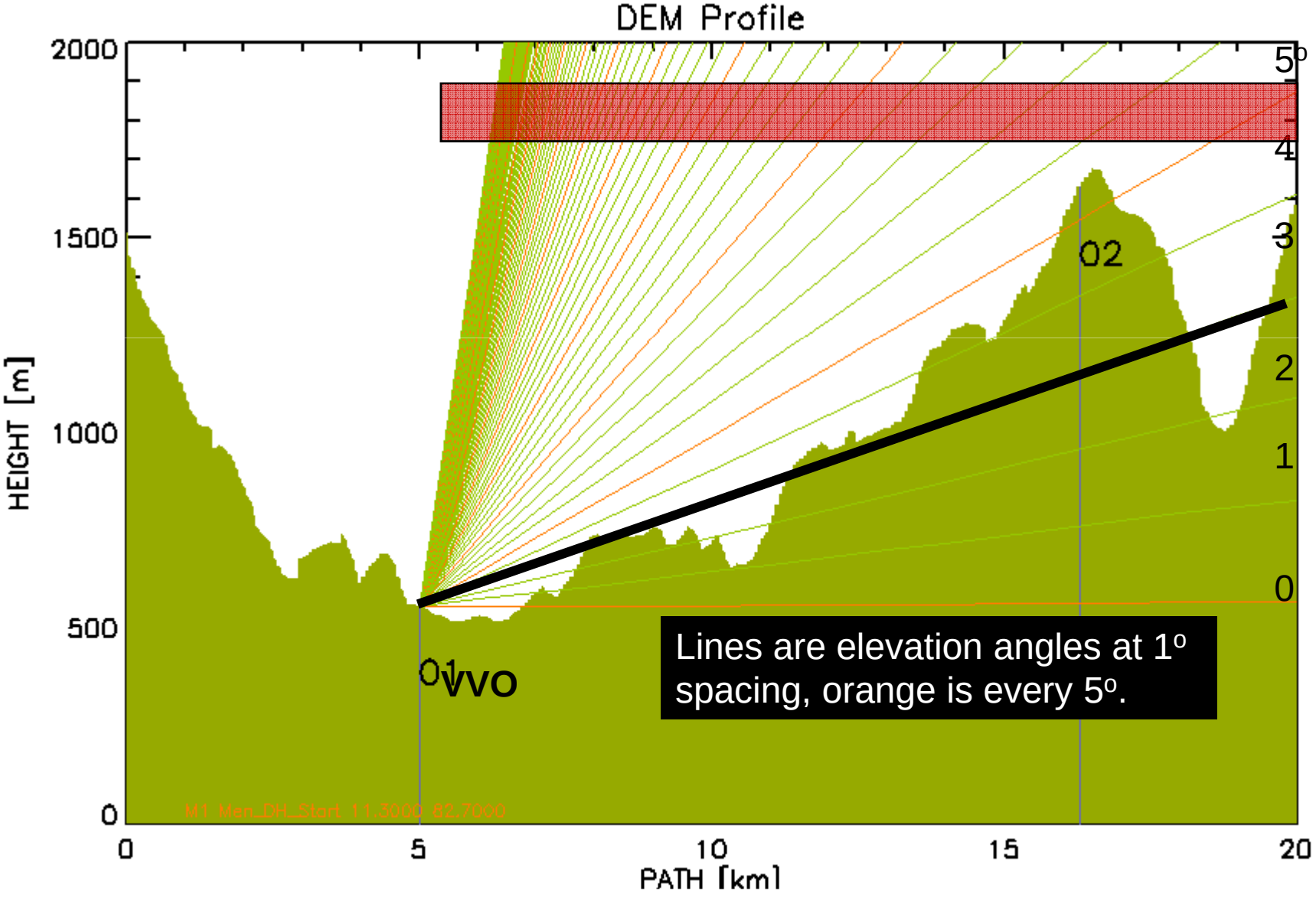
Fuzzy Logic Technique for Removal of Anomalous Propagation



NONQC QC

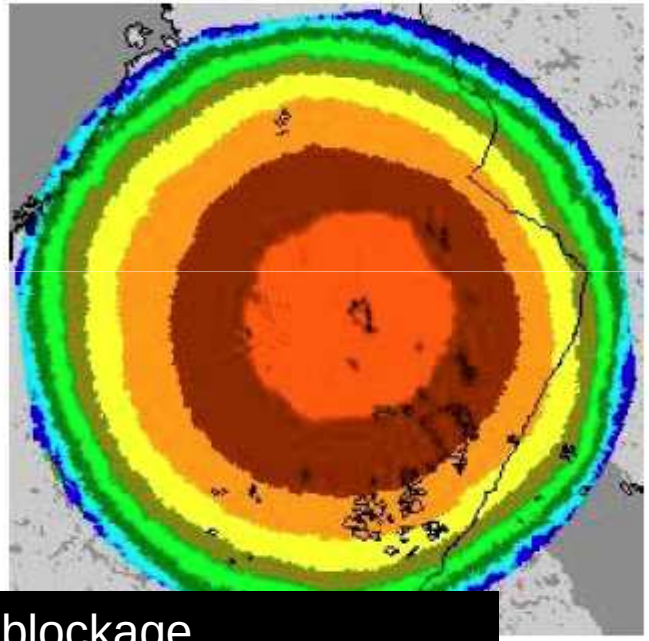
Liping Liu, CMA

CAPPI is a classic technique to overcome ground clutter



Iso-range “Variance” as an intercomparison Metric

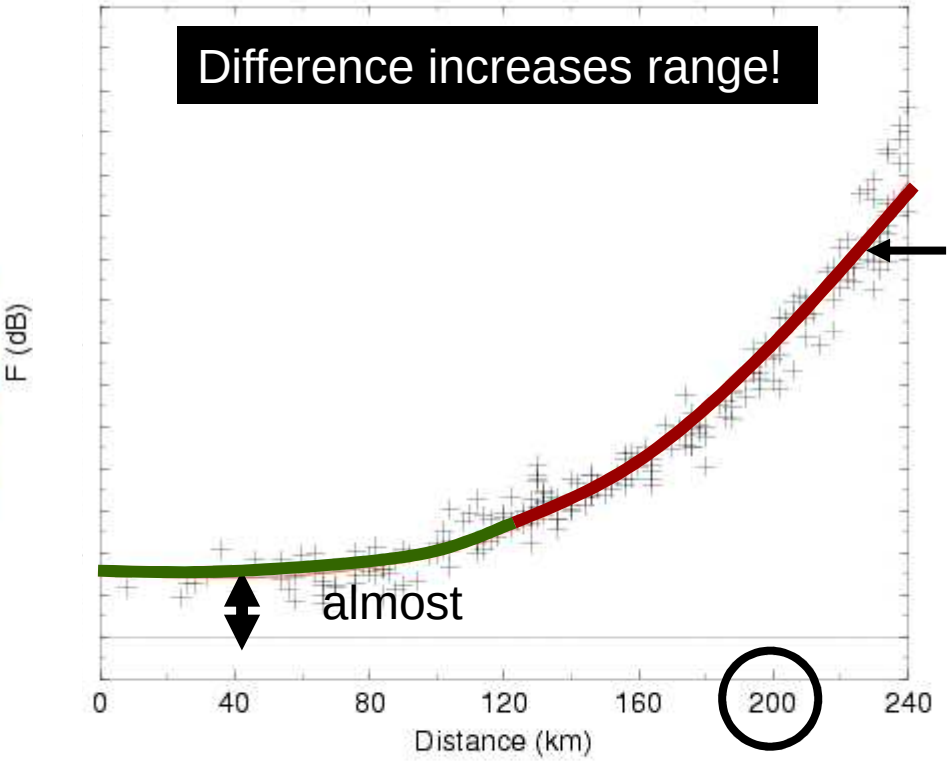
Accumulation – a winter season

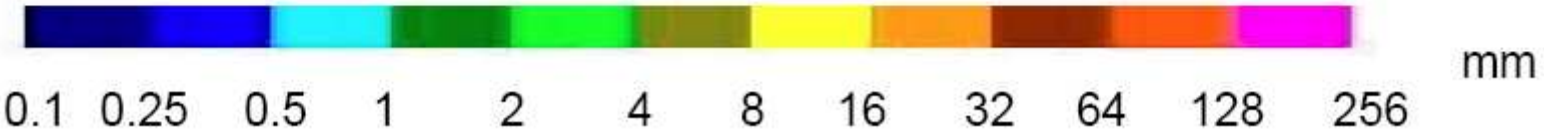


No blockage
Rings of decreasing value

log (Raingauge-Radar Difference)

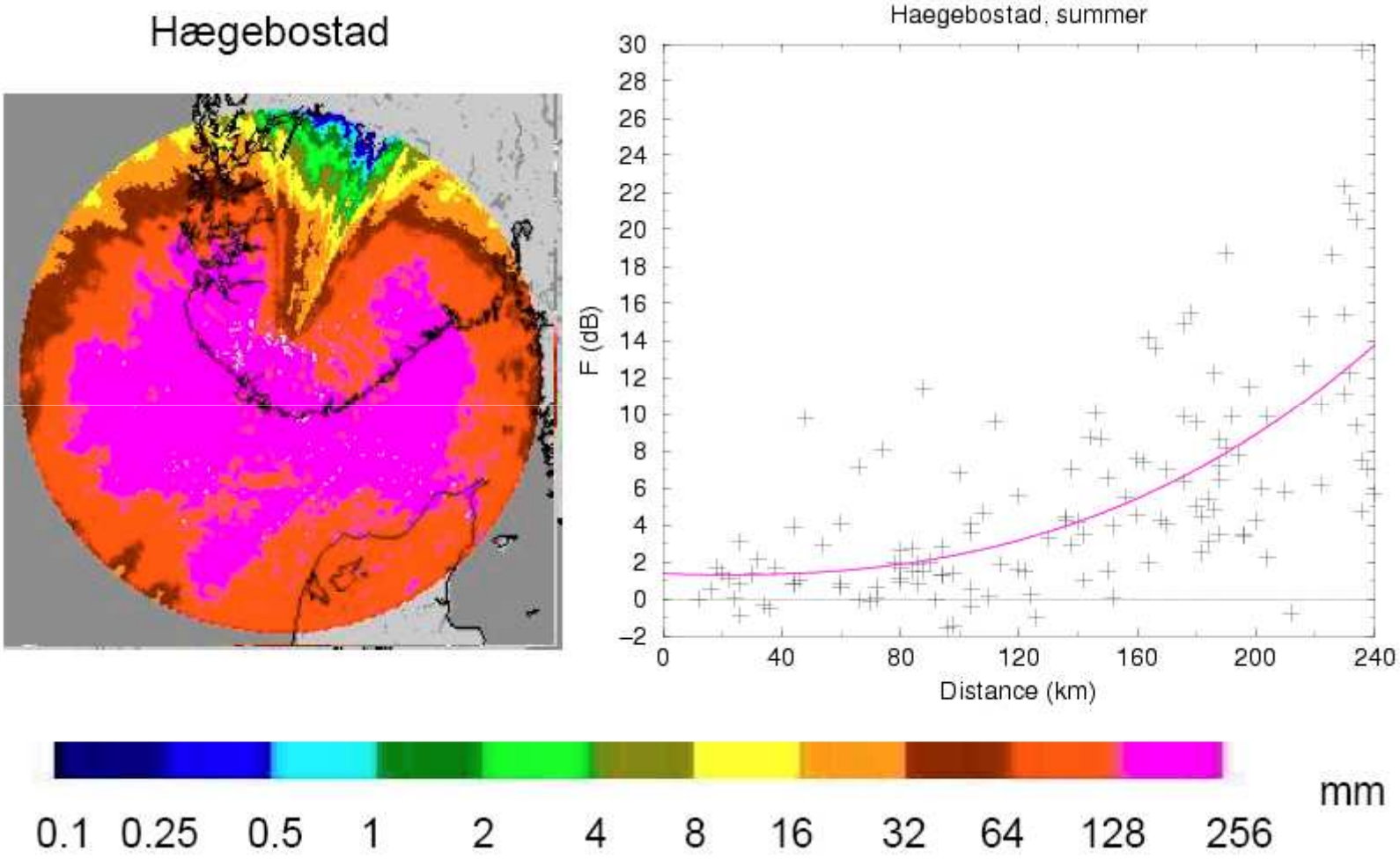
Difference increases range!





Daniel Michelson, SMHI

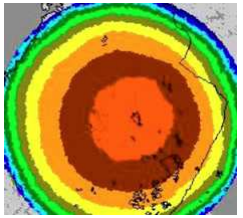
Variance Metric

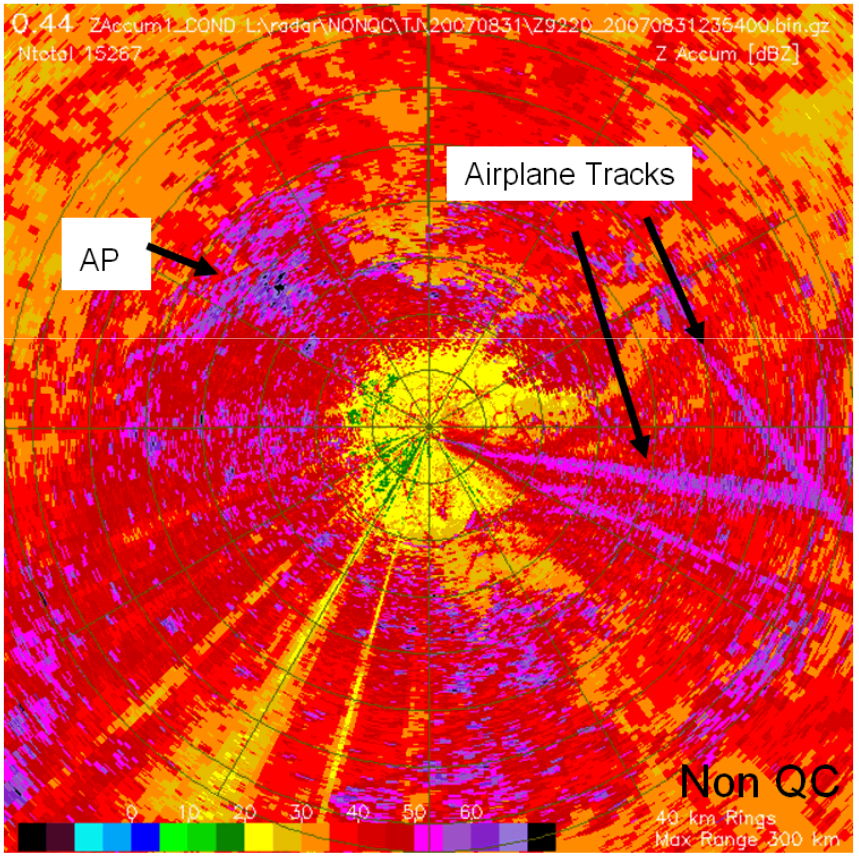


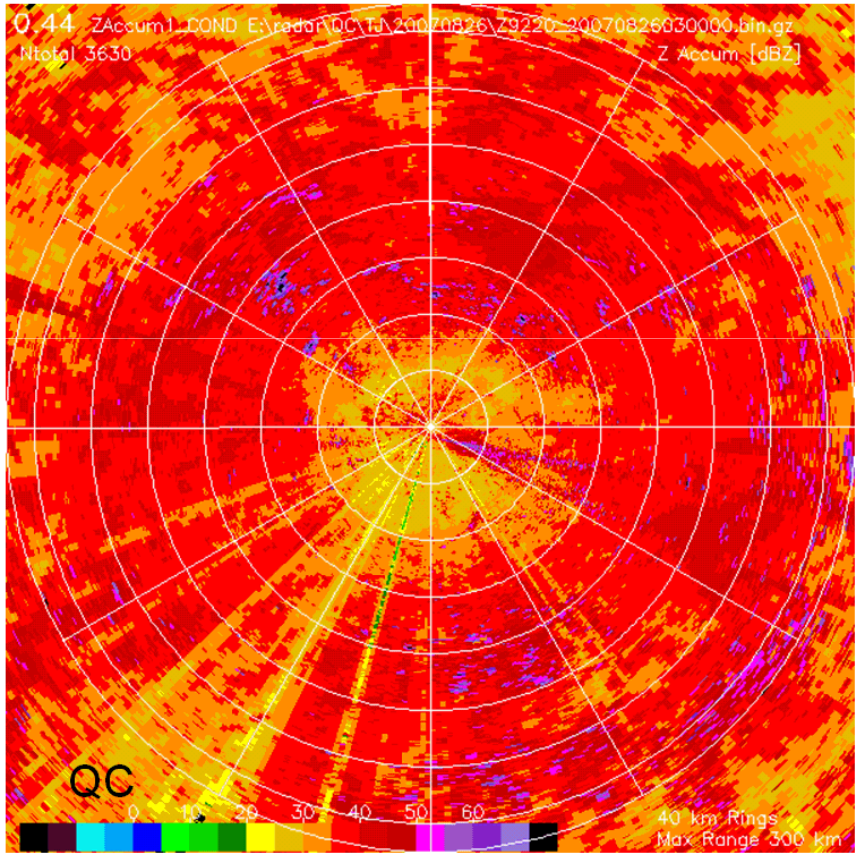
Similar to before except area of partial blockage contributes to lots of scatter
Algorithms that are able to infill data should reduce the variance in the scatter!

Michelson

What length of data sets are needed?



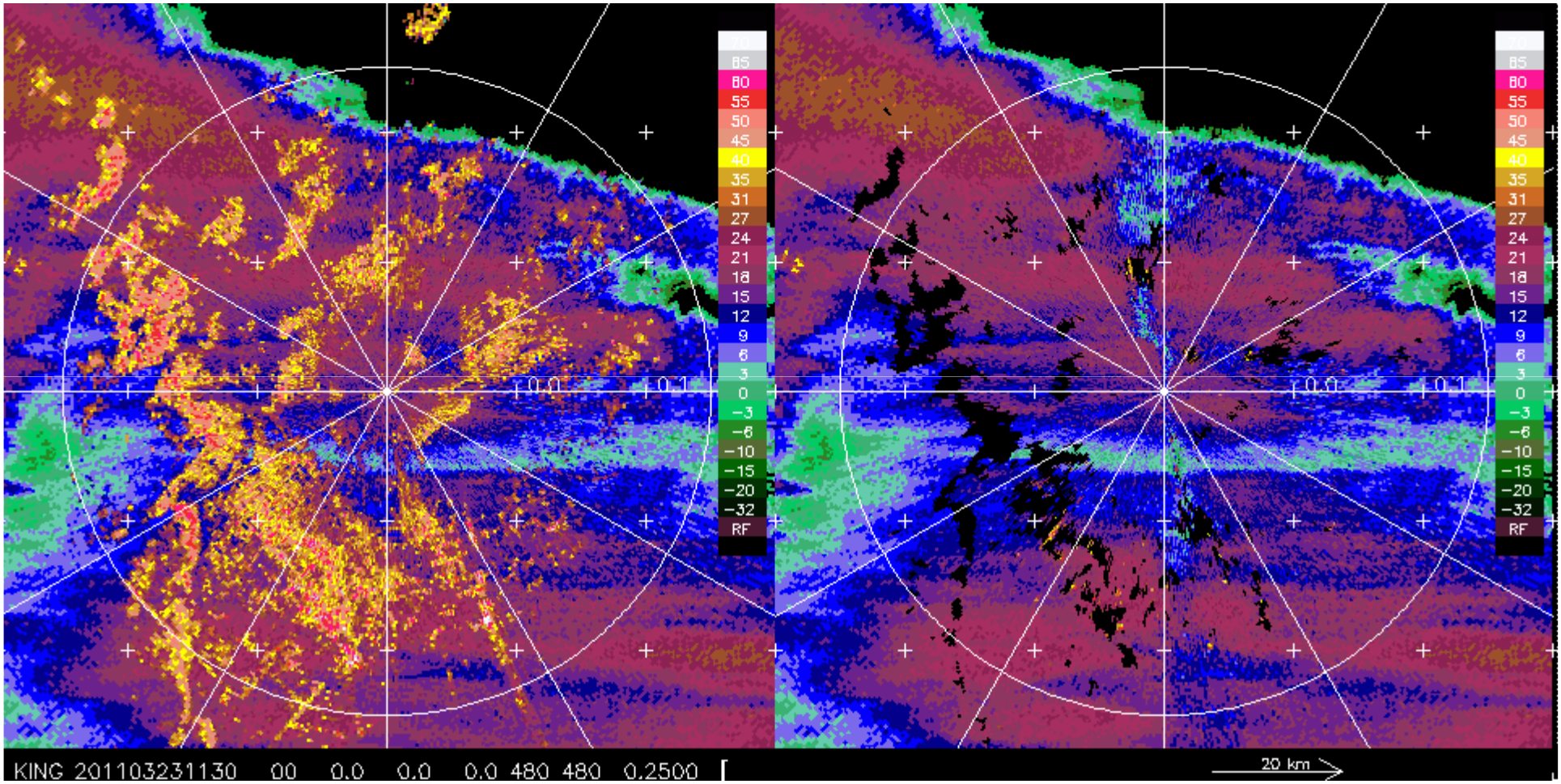




Highly Variable

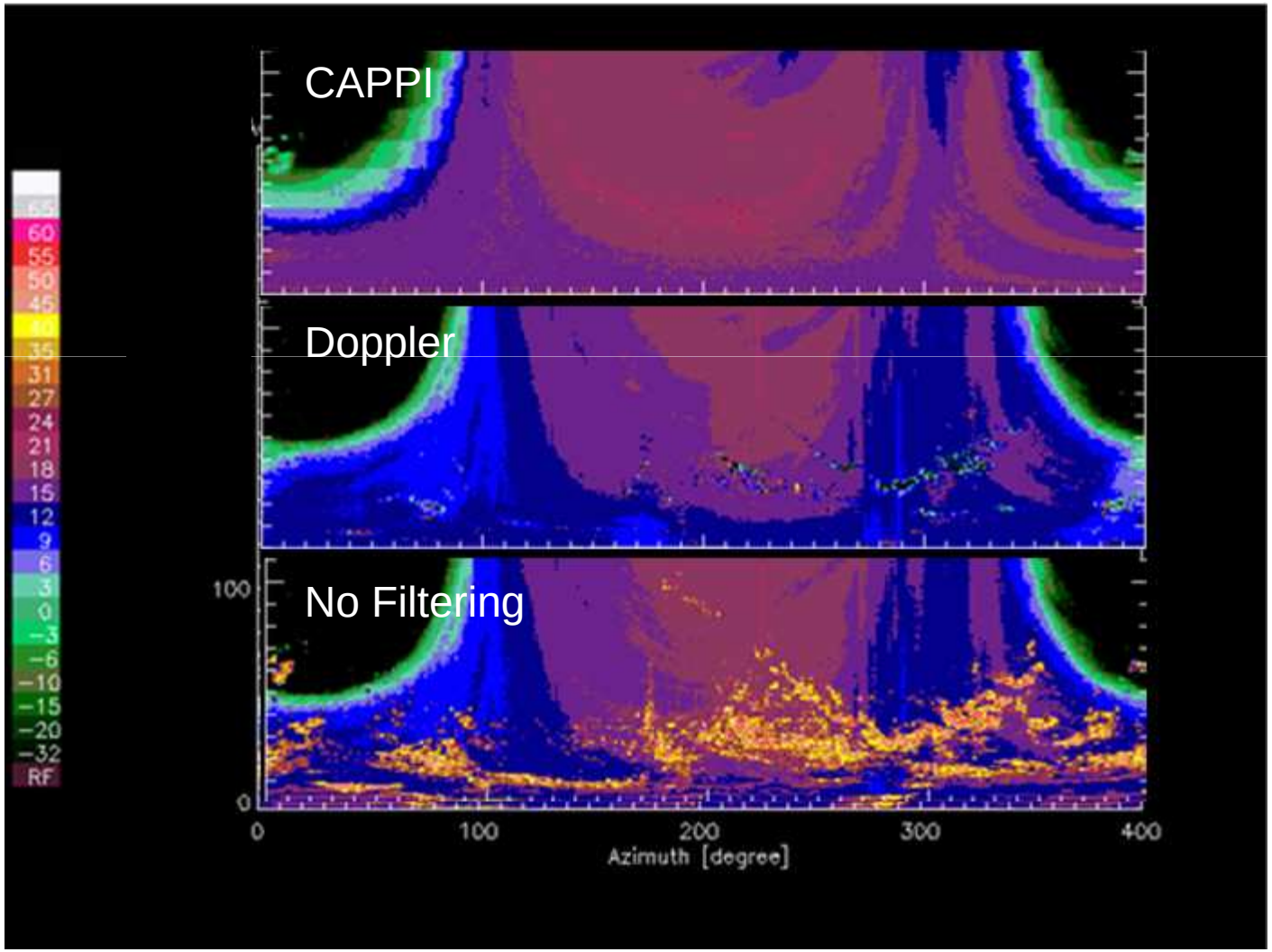
More uniform, smoother, more continuous

1. Uniform weather
2.Doppler filter can filter weak weather

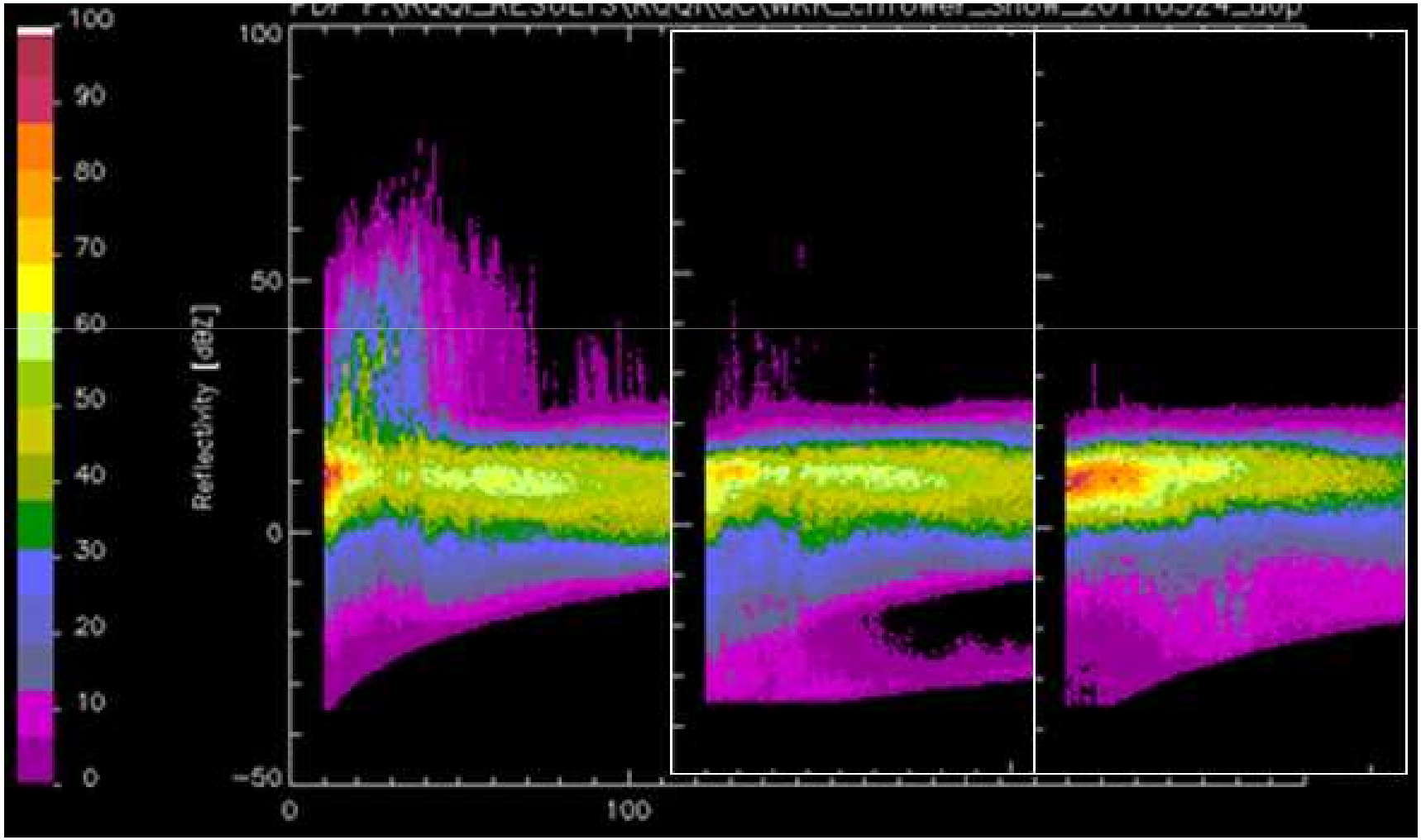


The data accumulates to uniform pattern with an area of blockage. Widespread snow. Urban (skyscrapers) and small terrain clutter. IRIS formatted data. 24 elevation angles. Doppler (dBZT, dBZc, Vr, SPW) at low levels. Range res = 1km or 0.5 km. Az res = 1 or 0.5 degrees.

BSCAN of Z accumulation with no filtering, Doppler and CAPPI



Probability Density Function of Reflectivity as a function of range



Spread of PDF (at constant range) for various cases and techniques…

Case	Technique							
	RAW	CAPPI15	CAPPI30	Precip-ET	DOPPLER	REC_AP	REC_SC	CMA_AP
BOM_seaClutter		7.3	8.1		8.5	8.7	8.5	
Saudi_20020517		23.6	20.3		26	7.3	26.4	
Saudi_20020527		18.8	15.3		21.2	10	20	
TJ_bigAP_20060815_nonQC		8.2	7.2		8.7	7	9.4	
TJ_mix_20070825_nonQC		8.4	8.8		8.2	8.5	8.8	7.2
TJ_mix_20070825_QC		7.5	7.9		7.2	7.9	8.1	
VVO_zeroNotch_snow	7.3	7.1	5.6		6.7	6.7	6.7	
WKR_cnTower_Snow_201	11.5	10.3	8.4	7.4	9.0	10.3	10.6	
WYR_uniform_blockage_201	9.3	9.4	8.1	6	8.8	8.6	8.8	
XLA_uniform_20100101_dop	5.9	4.4	3.1	3.2	4.6	4.4	4.5	

Status and Acknowledgements

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- Gaussiat, UK/OPERA HUB
- Donaldson, Dixon, Zhang,…