D3R Observations

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Dual-frequency, Dual-polarized, Doppler Radar (D3R)

System Characteristics

Frequency	Ku-13.91 GHz, Ka-35.56 GHz
Beamwidth	0.9 deg @ both frequencies
Maximum range	38 km
Maximum unambiguous Doppler velocity	25m/s
Minimum detectable signal (Ku, Ka)	Ku -9 dBZ, Ka -3 dBZ at 15 km (noise equivalent)
Angular coverage	0-360 degree Azimuth, -0.5-90 degree Elevation
Clutter Suppression	GMAP-TD
Data Format	NetCDF

List of Measured and Derived Products

Measured Products	Symbol	Frequency	Comments
Reflectivity	Z	Ka and Ku	Attenuated and corrected
Differential Reflectivity	Z_{DR}	Ka and Ku	Attenuated and corrected
Differential Propagation Phase	ϕ_{dp}	Ka and Ku	
Specific Differential Phase	K_{dp}	Ka and Ku	
Co-polar Correlation Coefficient	ρ_{co}	Ka and Ku	
Linear Depolarization Ratio	LDR	Ka and Ku	Attenuated and corrected
Cross-polar Correlation Coefficient	ρ_{cx}	Ka and Ku	
Radial Velocity	v	Ku	
Derived Products			
Rainfall Rate	R		Various algorithms
Drop Size Distribution	DSD		Various algorithms

Future Plans

Upgrades

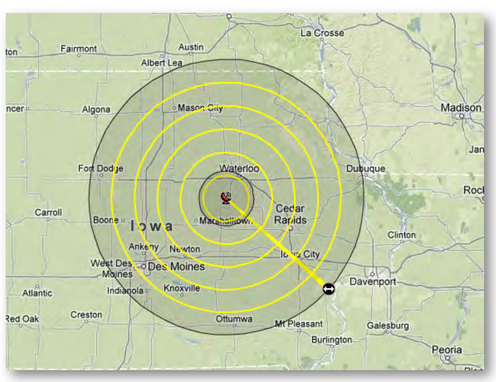
Ka-band transmitter upgraded in January 2013

Add co-located radiometers

First as a separate instrument, next as shared aperture

Field Programs

1. Routine data collection at Wallops, VA site co-located with NPOL
2. IFloodS (May 1 – June 15)
3. IPHEX and OLYMPEx



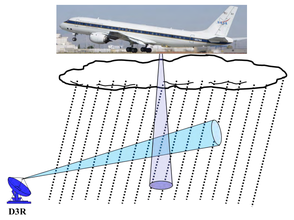
GCPEx and Winter Observations

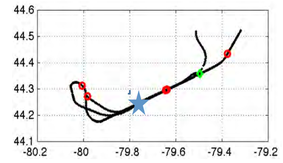
GPM Cold Season Precipitation Experiment (GCPEx)

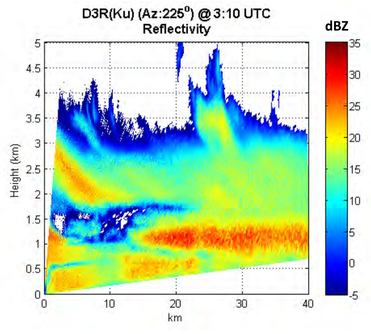
Conducted in Ontario, Canada/Great Lakes Environment Canada CARE site from January 17th to February 29th, 2012. D3R collected Ku and Ka (low power transmitter) data during the experiment.

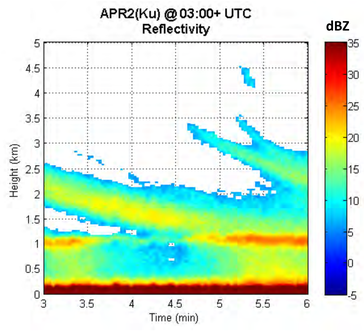
D3R and APR2 (Ku) Comparison

January 27, 2012 (Approx. 3:00 UTC)



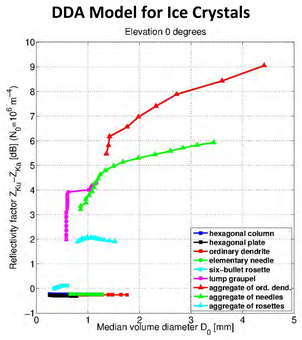


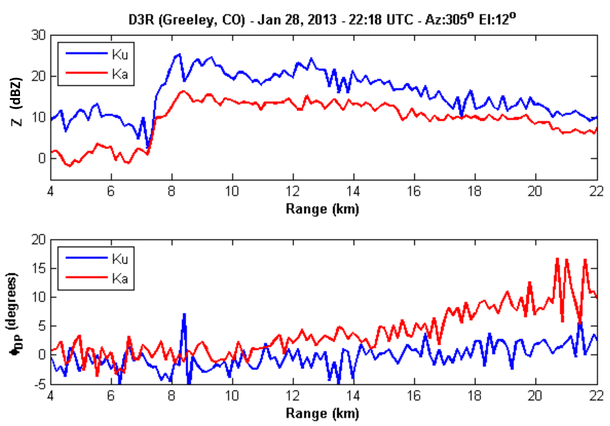




Colorado Observations

(Greeley, CO)



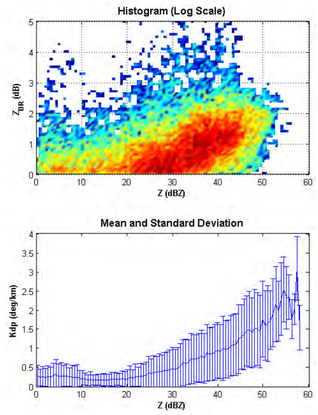


Summer Observations

(Greeley, CO)

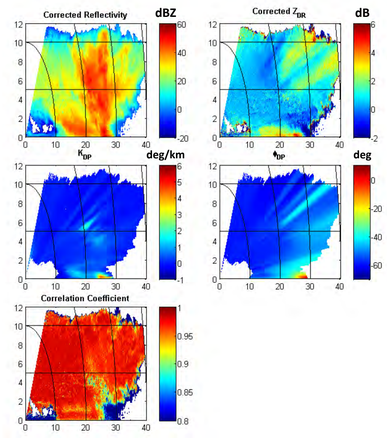
Observation Statistics (Ku)

May 6, 2012
(2:42UTC to 2:53UTC)



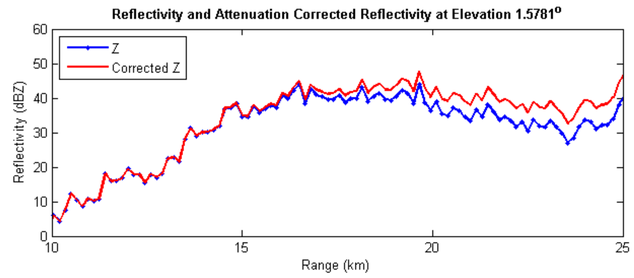
RHI Scan (Ku)

May 6, 2012
(2:52UTC)



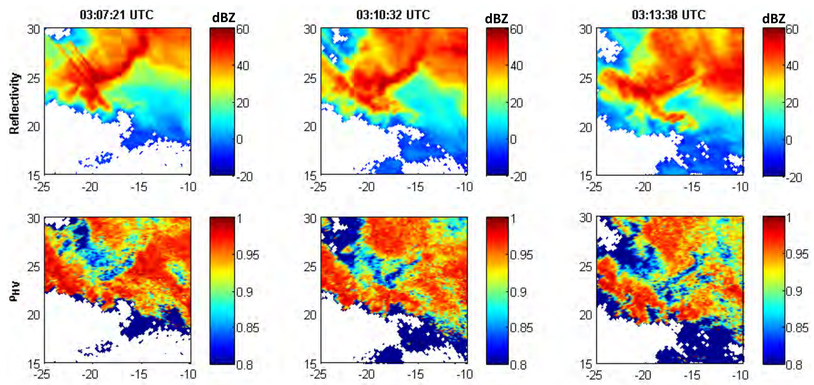
Real-time Attenuation Correction (Ku)

May 6, 2012 (2:52UTC)



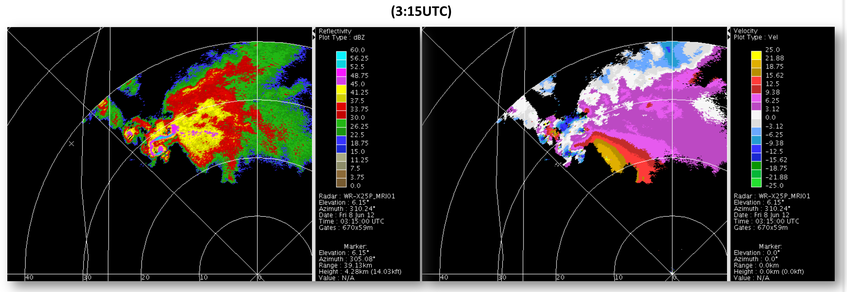
Tornado Observations (Ku)

Formation of the Tornado Hook Echo
June 8, 2012



CSU X-Band Radar

June 8th, 2012
(3:15UTC)



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