

Improving WSR-88D (NEXRAD) Base Data Quality

Mike Istok

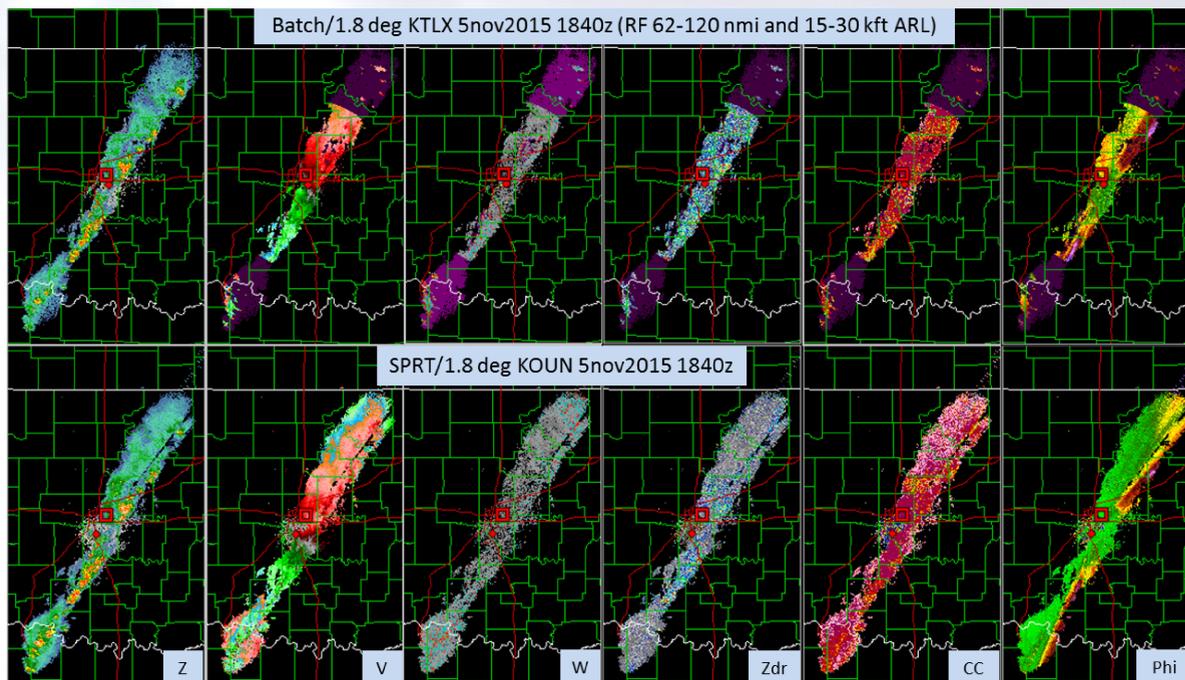
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The NEXRAD tri-agencies (Department of Commerce, National Weather Service (NWS); the Department of Defense, Air Force Weather; the Department of Transportation, Federal Aviation Administration (FAA)) continue to support long-term science and technology improvement initiatives for the WSR-88D.

Advanced signal processing techniques increase data coverage by reducing data voids caused by range folding, improve the ability to recognize severe storm signatures by reducing the variance (noisiness) of the data, and mitigate data biases from clutter filtering and from non-meteorological targets.

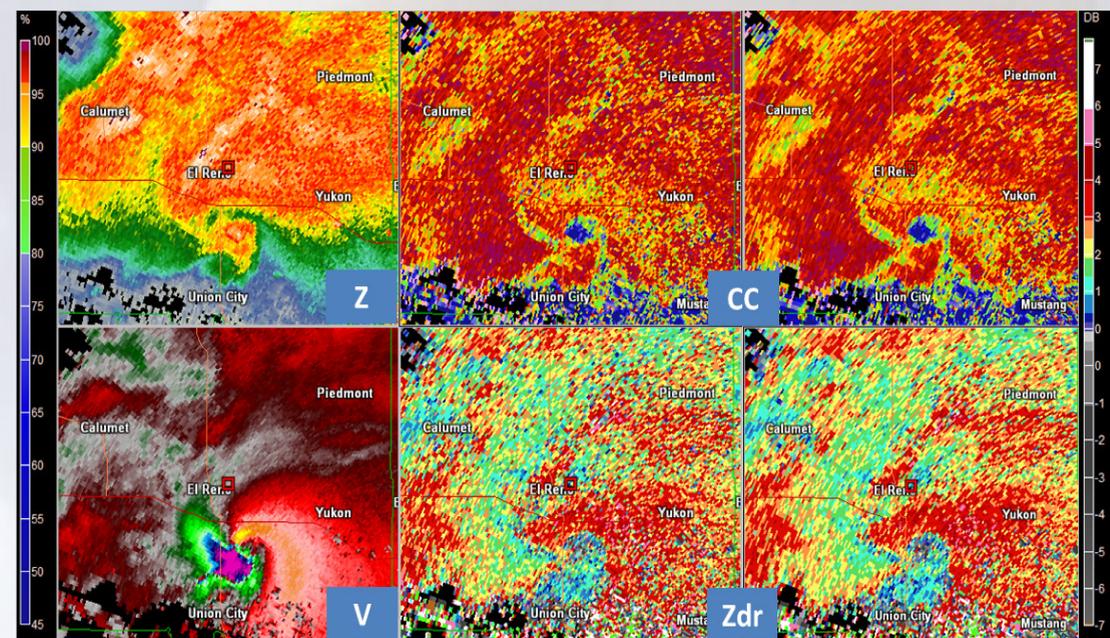
Staggered-Pulse Repetition Frequency (SPRT)

Mitigates Range and Velocity Ambiguity and Reduces Data Variance on Middle Elevation Angles



Meza Data Processing Window

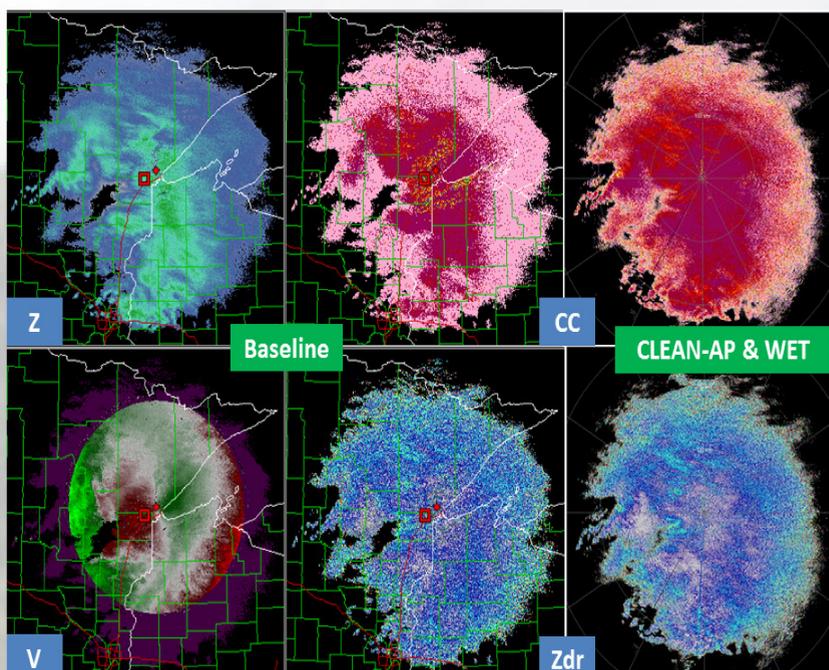
Reduces Data Variance for Dual Polarization Variables on the Lowest Elevation Angles



- For WSR-88D super-resolution scans, the von Hann window is applied to keep the effective beamwidth at about 1.06 deg (left and center images).
- Using a Meza window for Dual Polarization variables (right images) reduces variance by 30% and increases the effective beamwidth by 16%, to about 1.23 deg.

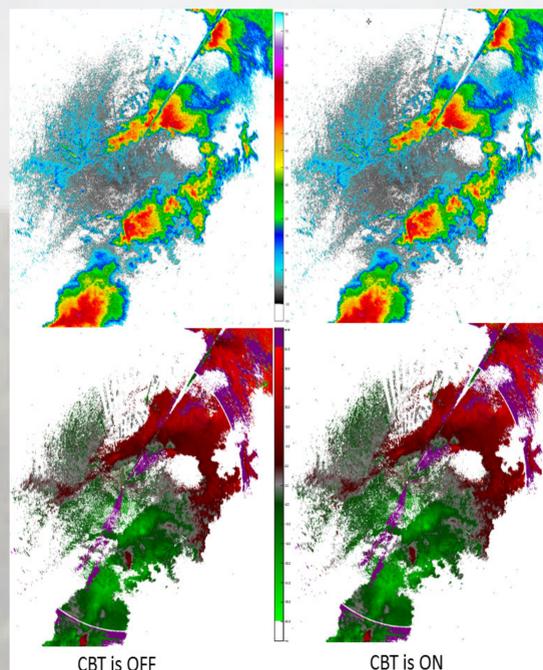
Clutter Environment Analysis using Adaptive Processing (CLEAN-AP) and Weather Environment Thresholding (WET)

Reduces Data Bias from Ground Clutter Contamination and Filtering of Ground Clutter



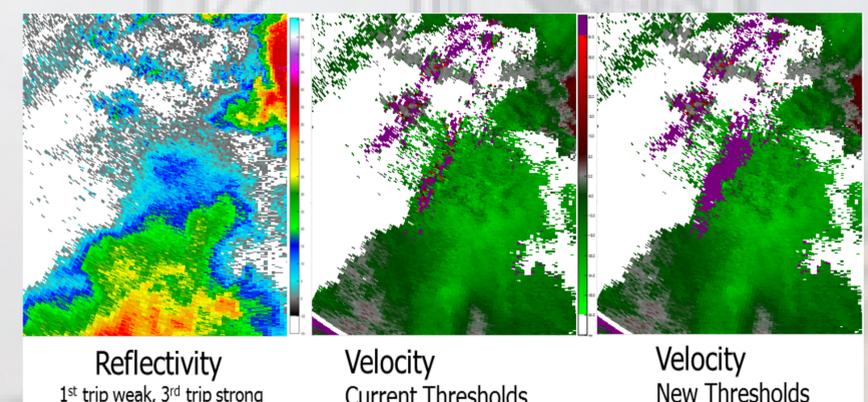
Coherency Based Thresholding (CBT)

Recovers Sensitivity Lost by the Dual Polarization Upgrade



Improved SZ-2 Censoring Thresholds

Provides Better Quality Control of Data in Regions of Range Folding



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