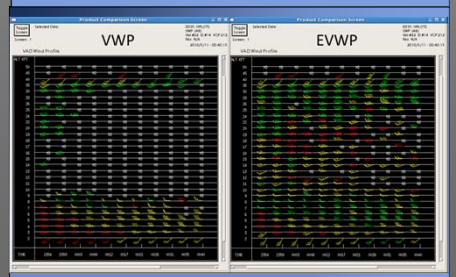
368 WSR-88D Program Data Quality and Efficiency Enhancements - Plans and Status

WSR-88D Data Quality Greatly Improved…More Possible!

Since 1993, the Radar Operations Center (ROC) has led a joint project with the National Severe Storms Laboratory (NSSL) and the National Center for Atmospheric Research (NCAR) for improving the foundational radar data quality. The work is focused on the transition of new science research to operations, and has resulted in many significant improvements. This poster highlights plans for the future of foundational radar data quality improvements expected to result from a continuation of this work.

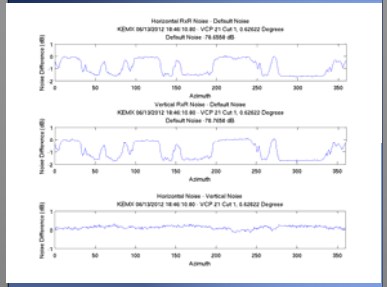
This poster also shows recent and soon to come improvements in operations including new scan methods and a new velocity dealiasing algorithm

Enhanced Velocity Wind Profile

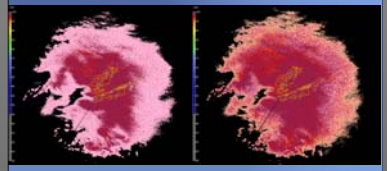


A comparison of legacy VWP (left) and Enhanced Velocity Wind Profile (EVWP) (right) products using the same Level 2 data set from the Oklahoma City, OK WSR-88D (KTLX) at 00:40 UTC on May 11, 2010. The EVWP provides an average of approximately 50% more wind observations and more accurate observations.

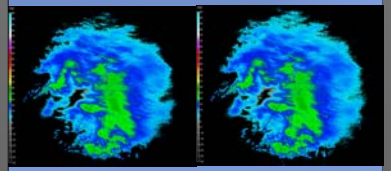
On-line Determination of the System Noise Level



This noise estimator delivers a value for each radial by analyzing range dependent power variations.

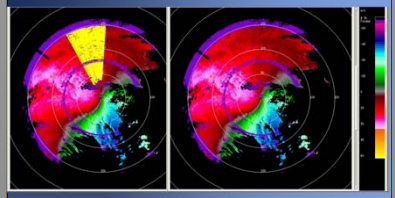


The new estimator greatly improves correlation coefficient. The left image shows legacy CC, the right was processed with radial dependent noise power.

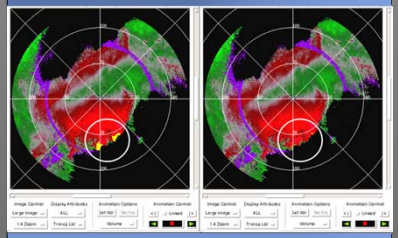


The reflectivity image on the right, processed with the radial noise estimator, shows some weak signals can be recovered if the correct noise powers are used.

2D Velocity Dealiasing



Using the same Level 2 data set of Hurricane Irene on August 28, 2012 from the Upton, NY WSR-88D (KOKX) at 07:21 UTC and 0.5o elevation, a comparison of the Legacy VDA dealiased ½ deg azimuthal resolution velocity product is on the left, the 2-D VDEAL dealiased product is on the right. Irene's circulation center is 150 nm south-southwest of radar. Note the large yellow wedge of incorrectly dealiased velocities to the north-northwest for the legacy VDA.



Comparison of the velocity dealiasing algorithms along a thunderstorm outflow boundary from the Oklahoma City, OK WSR-88D (KTLX) on June 20, 2007 at 07:54 UTC. The legacy VDA (left) and 2-D VDEAL (right) products are displayed. Notice the two areas of Legacy VDA improperly dealiased velocities south of the radar along the leading edge of the gust front in the circled area (left image). The 2-D VDEAL product has only a very small error.

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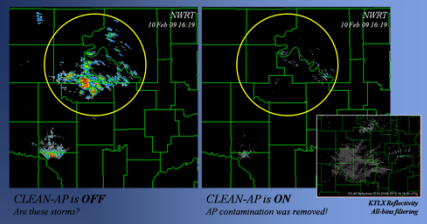
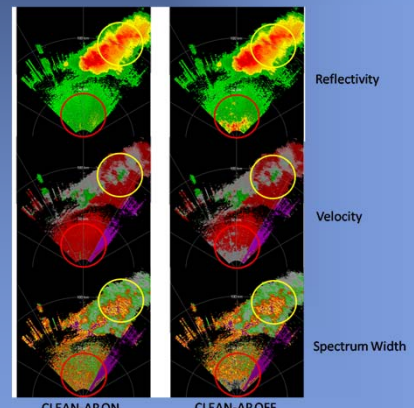
SPRT with CLEAN AP



The AP image shows a comparison of the KTLX radar with the NWRT PAR. The environment exercised the capability provided by the CLEAN-AP filer to automatically mitigate (detection and removal) ground clutter in both AP (yellow circle) and NP (near radar) conditions. The KTLX radar ran all bins clutter filtering to remove the AP ground clutter.



The RVW image shows how the moments (R,V,&W) with near-zero velocities from a meso-cyclone (yellow circles) are not harmed by the CLEAN-AP filter; while, ground clutter near the radar is mitigated quite nicely.

(Courtesy Dave Warde, OU/CIMMS/NSSL)

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