

Super Resolution for the NEXRAD Network

Sebastian Torres & Pam Heinselman, NSSL (Pam is also member of NWA Remote Sensing Committee)
21 December 2008

Legacy-resolution base data on the NEXRAD network consists of reflectivity on a 1 km-by-1° polar grid and Doppler velocity and spectrum width on a similar 250 m-by-1° grid. Researchers at the National Severe Storms Laboratory have shown that some meteorological signatures can be detected at greater ranges using radar data with finer spatial resolution on a 250 m-by-0.5° grid. Radar data produced this way and with a range coverage of 300 km is termed super-resolution data. Super-resolution will be available on the NEXRAD network beginning in 2008 and will be produced for the lower tilts (below 2°) of all volume coverage patterns. Because current algorithms that operate on base data are not ready to handle the finer spatial resolution and the higher statistical errors associated with super-resolution data, initially this data will be used for visualization only. Super-resolution radar data has the potential to increase the detection range of mesocyclone and tornado vortex signatures as well as increase the visibility of Doppler velocity and reflectivity signatures associated with severe weather. These can contribute toward an increase in warning times for severe thunderstorms and tornadoes.

For more information, please refer to NOAA's Weather Decision Training Branch RDA/RPG Build 10 training module (<http://wdtb.noaa.gov/buildTraining/Build10/docs/build10deploy.pdf>)

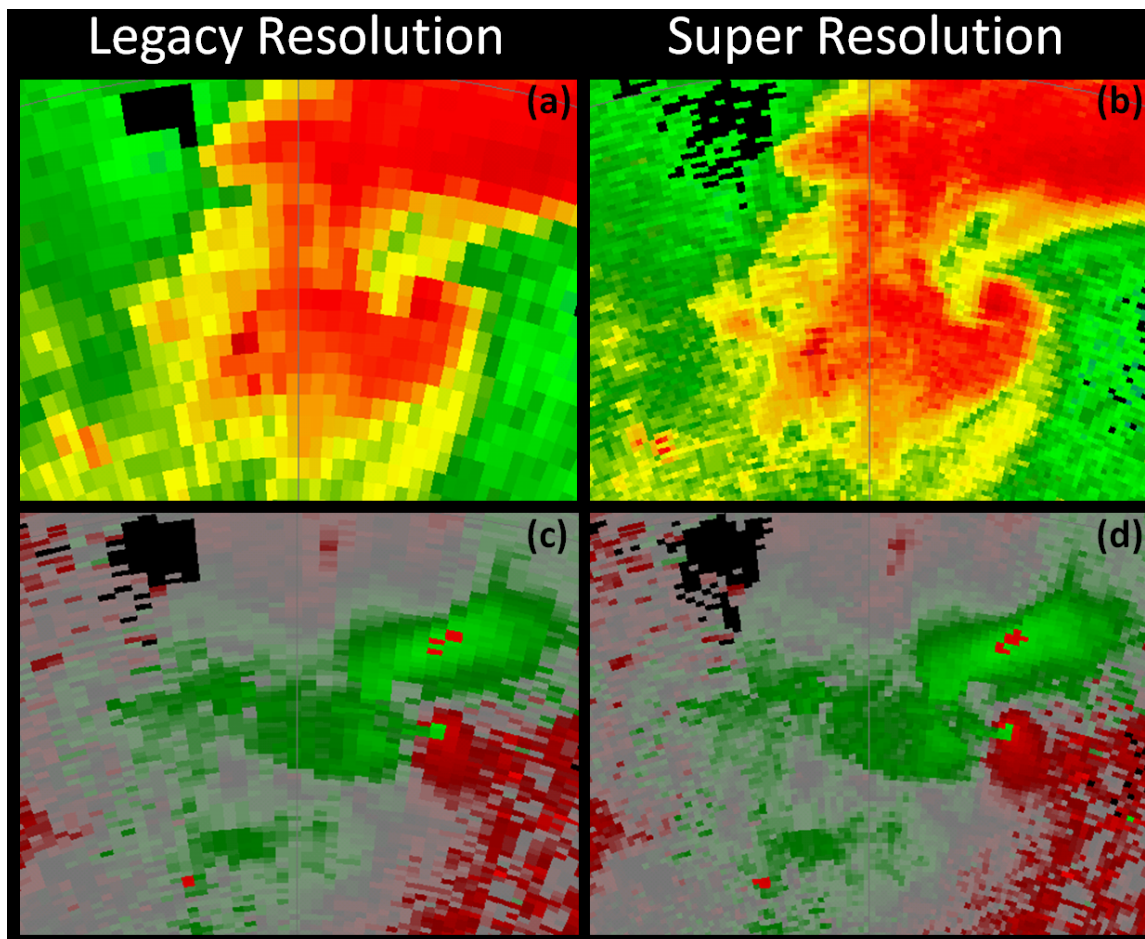


Figure 1. Reflectivity (a,b) and Doppler velocity (c,d) fields obtained during a tornado outbreak in Oklahoma City on 9 May 2003 with the KOUN radar in Norman, OK. Fields were generated with legacy resolution (a,c) and super resolution (b,d).