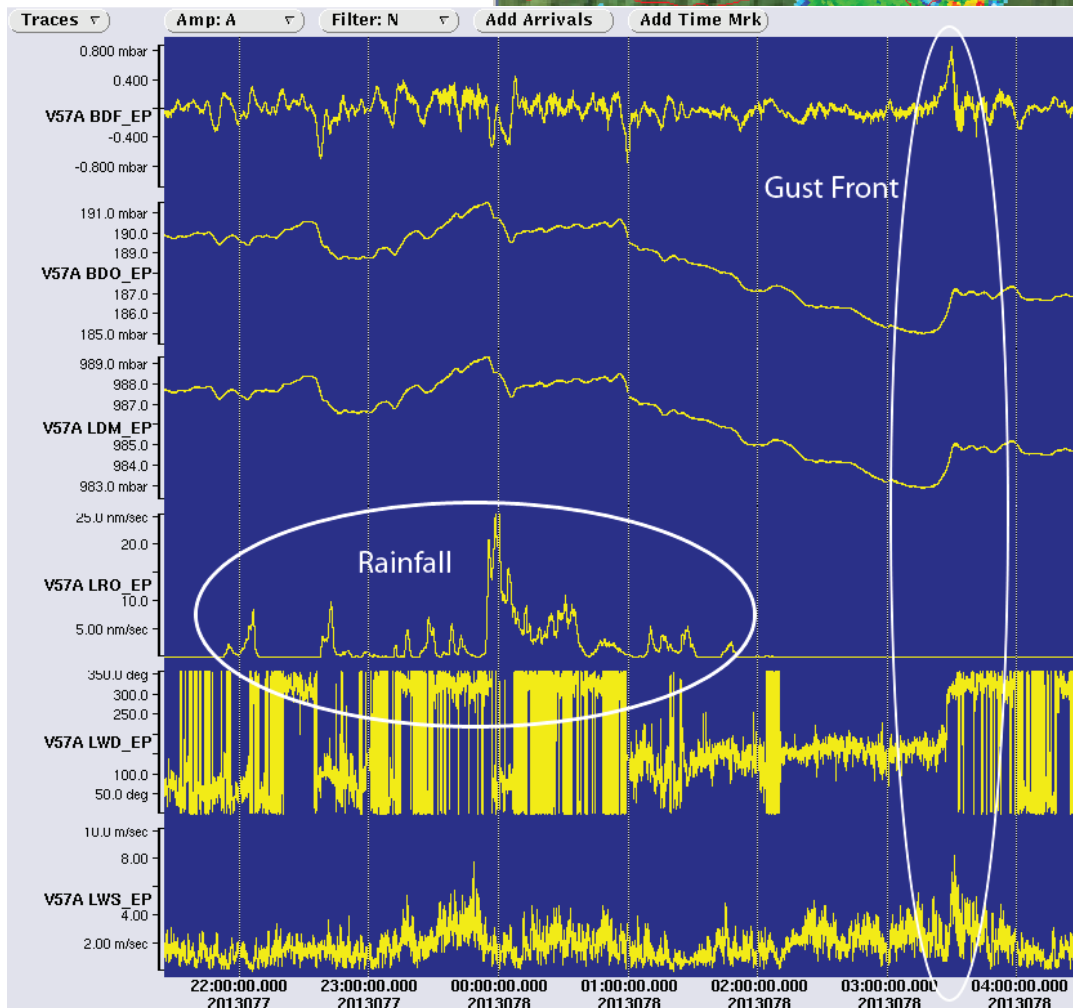
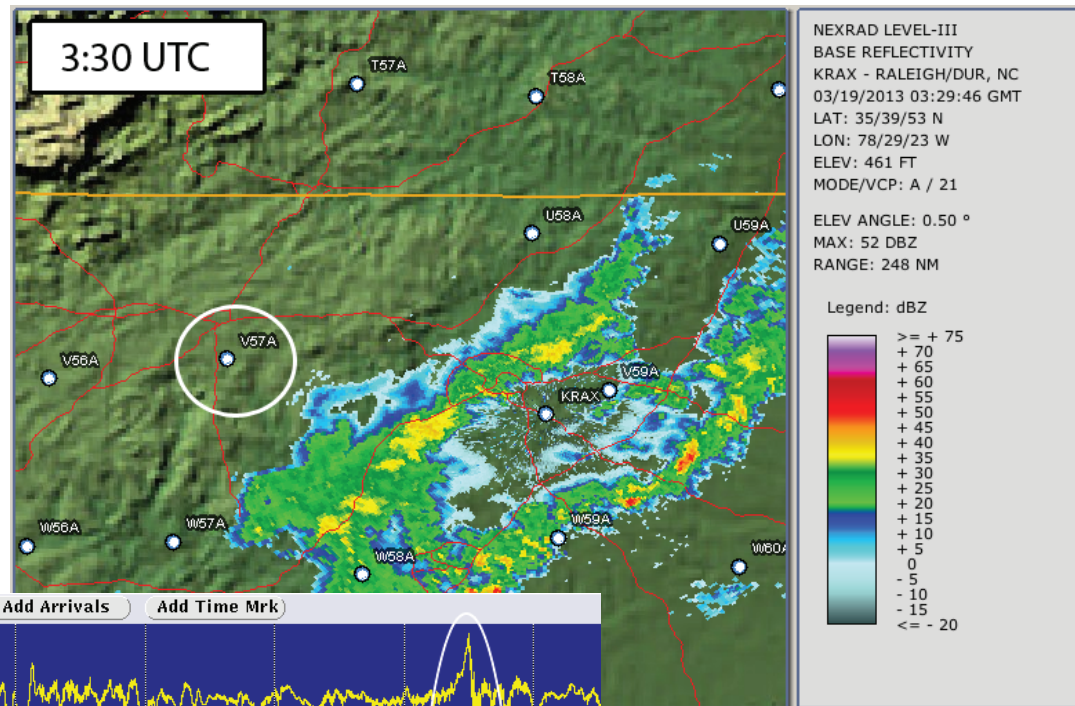


Introducing the Full-Met Array

by Jonathan Tytell, Frank Vernon and Jennifer Eakins

During the first quarter of 2013 the USArray Transportable Array network incorporated Vaisala WXT520 weather stations into twenty-five of the newly installed or pre-existing TA stations throughout North Carolina, southern Virginia and a small portion of South Carolina. Previous use of the TA network for meteorological research and real-time data analysis has been limited to observations of surface pressure. With the additional Vaisala sensor it is now possible to analyze localized weather features in much greater capacity. Events such as heavy rainfall and strong winds can now be detected in real-time at 1 sample-per-second (sps) and thus provide a benefit for the National Weather Service (NWS) and other groups interested in now-casting severe weather. It may even be possible to track gust fronts from severe thunderstorms in real-time to determine direction, propagation speeds and magnitudes in order to help protect life and property. Furthermore, we will demonstrate the utility of such a weather array by comparing its data with those from National Weather Service ASOS stations throughout the same footprint as the twenty-five TA stations.



Above image depicts a storm rolling across the full-met portion of the TA network at 03:30 UTC on 3/19/2013. Station V57A is circled. Radar data is from the Raleigh NWS office.

Left image depicts data for TA station V57A. The channels are (from top down): 40 sps NCPA infrasound and Setra 278 surface barometric pressure, 1 sps MEMS surface barometric pressure, Vaisala rainfall rate, wind direction and wind speeds all at 1 sps. The rainfall from the front is indicated as is a gust front crossing V57A at ~3:30 UTC. The Doppler image shows no evidence of this gust front, though, which emphasizes the added benefit of the TA data for weather now-casting: Sometimes the tools in place by the NWS may not be enough to track such weather phenomena, which therefore makes the real-time TA weather datasets highly useful.