Background

- The ULM S-band polarimetric Doppler radar became operational in early October 2016.
- Radar system supplied by Enterprise Electronics Corporation (EEC).
- Fills a low-level NEXRAD coverage gap in northeast Louisiana & southeast Arkansas.

Specifications

<table>
<thead>
<tr>
<th>EEC DWSR-8501S SIDPOL</th>
<th>Magneton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2.950 GHz</td>
</tr>
<tr>
<td>Wavelength (MHz)</td>
<td>(10.162 - 2.950 MHz)</td>
</tr>
<tr>
<td>Transmitter Power</td>
<td>850 kW (peak power)</td>
</tr>
<tr>
<td>Pulse Width</td>
<td>0.5, 0.8, 1.0, &amp; 2.0 μs</td>
</tr>
<tr>
<td>Antenna Diameter</td>
<td>8.5 m (28 ft)</td>
</tr>
<tr>
<td>Beamwidth</td>
<td>0.95°</td>
</tr>
<tr>
<td>Gate Spacing</td>
<td>≤ 250 m</td>
</tr>
</tbody>
</table>

• Considered “88D equivalent.”
• Standard (2, VR, SW), polarimetric (ZDR, Ψ90, KDP, ρhv), & additional radar derived products available.
• Data archived in the CFradial format & available in the NEXRAD Level-2 format upon request.

Teaching, Research, & Operations

- ULM offers the only atmospheric science or meteorology undergraduate degree in LA.
- Supports practical, hands-on learning in the undergraduate radar meteorology course @ ULM.
- 5 student radar operating workstations added to the atmospheric science teaching laboratory.
- Junior & senior students gain radar operating experience as part of standard coursework.
- The radar enhances the research capability of the Atmospheric Science department.
- Leverage for additional external funding opportunities & equipment acquisition: 4 active grant proposals in various stages of development or submission.

Operations:

- 24/7 operations with adaptable scan strategies; not bound by conventional NEXRAD VCPs.
- Radar is monitored and/or operated by Dr. Murphy & ULM students.
- NWS Shreveport, LA & Jackson, MS gained access to live data beginning late February 2017. Access is provided via a private data polling site for the GR2Analyst radar program.

Operational Success: 2 April 2017

- Supercell thunderstorms developed during the afternoon hours across portions of northeast Louisiana.
- 1 EF2, 3 EF1, & 2 EF2 tornadoes developed south & southeast of Monroe, LA.
- The ULM radar was the primary source for warning decisions at NWS Jackson over a 2-hour period during the afternoon.
- The radar was operating in 3-tilt volumes (0.7°, 1.8°, & 3.1°), providing new updates every 56 s.

Caldwell/Franklin/Richland Tornado

- Tornado developed @ 2117 UTC.
- 1st Tornado warned by SHV at 2049 UTC based on mid-level rotation from KPOE.
- Intentional KULM sector blank initially shields low-level data during tornado development.
- TDS appears on KULM as supercell exits sector blank; TDS unclear on NEXRAD data.
- Tornado warned by JAN at 2118 UTC & wording enhanced @ 2123 UTC to “radar confirmed tornado” based on KULM data.

Operational Success: 30 April 2017

- 29 tornadoes occurred in the JAN CWA associated with an early morning QLCS; most were > 100 km distance from KULM.
- Right: Brief TDS on KULM at far eastern edge of SHV CWA within Russell Sage Wildlife Management Area; no public damage reports and no official survey.

South Richland and Mangham Tornadoes

- Same initial cell as first example; produced two additional tornadoes in Richland Parish and near Mangham, LA.
- KULM indicated two concurrent TDSs for ~2 minutes; confirmed by JAN damage survey.
- Mid-level rotation present on KDGX, but displaced north of actual low-level TDSs from KULM.
- No TDS present on KDGX.
- KULM data allowed JAN to extend tornado warnings with greater confidence than KDGX would’ve allowed.

Operational Success: 21 January 2017

- Another tornado occurred about 20 min later – EF1 near Oak Ridge, LA.
- Would’ve been unannounced and likely not surveyed (no public damage reports) without KULM data.

- Live data not available, however. KULM data provided after the event prompted a damage survey which confirmed an EF-1 tornado in Morehouse Parish.

Summary

- The polarimetric S-band Doppler weather radar at ULM has been incorporated into operations at NWS Shreveport and Jackson.
- Its value was proved during an active Spring 2017 severe weather season in the ArkLaMiss, where it was used extensively to protect lives and property.
- At least 5 "extra" tornadoes surveyed by NWS Jackson that may not have otherwise been surveyed (no damage reports; no tornado indication on NEXRAD; TDS on KULM).
- Future research will include testing novel scan strategies with NWS meteorologists and improved precipitation estimation.
- Outstanding issues: Data availability in AWIPS-II and inclusion in MRMS.