# The University of Louisiana at Monroe's Polarimetric Doppler Radar: Teaching, Research, and Operations

P264

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***Questions or Comments?*** *Email murphy@ulm.edu*

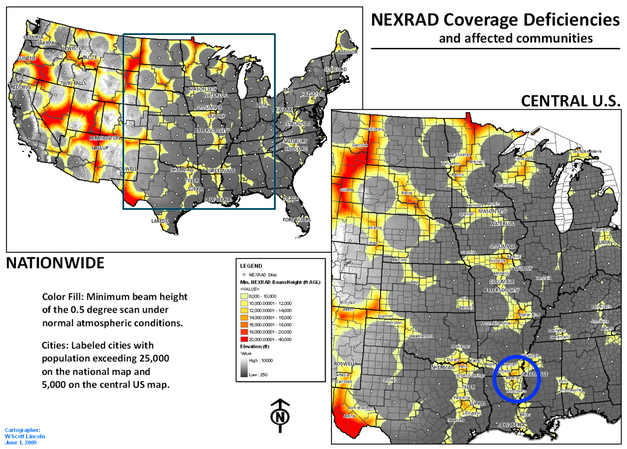
## 1. Introduction

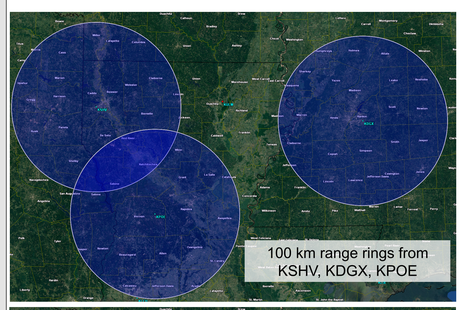
Through a partnership between university, state government, & the private sector, the University of Louisiana at Monroe (ULM) has acquired a S-band polarimetric Doppler radar, scheduled to be operational by early 2016.

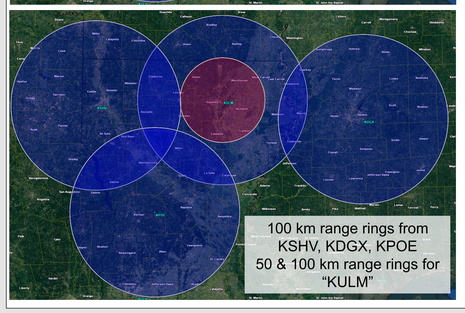
The radar system, supplied by Enterprise Electronics Corporation (EEC), is fully funded by a $3 million grant awarded to ULM through the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP).

## 2. NEXRAD Gap Filler

At its site near the Monroe Regional Airport, the ULM radar will fill a low-level NEXRAD coverage deficiency in northeast Louisiana and southeast Arkansas. This region, prone to high impact weather events, has a population near 500k.




Assuming standard refraction & 0.5° elevation angle, minimum beam height @:

- 50 km ≈ 600 m AGL (2000 ft)
- 100 km ≈ 1500 m AGL (5000 ft)

## 3. Specifications

| | EEC DWSR-8501S SIDPOL | WSR-88D |
|---|---|---|
| **Transmitter Type** | Magnetron | Klystron |
| **Frequency (Wavelength)** | 2.7 – 2.9 GHz (10 cm @ 2.7 GHz) | 2.7 – 3.0 GHz (operates at 10.71 cm) |
| **Transmitter Power** | 850 kW (peak power) | 750 kW (peak power) |
| **Pulse Width** | 0.8 – 4.0 μs | 1.57 & 4.57 μs |
| **Antenna Diameter** | 8.5 m (28 ft) | 8.5 m (28 ft) |
| **Beamwidth** | 0.95º | 1º |
| **Gate Spacing** | ≤ 250 m | 250 m |

The ULM radar is considered "88D equivalent"

Standard (*Z*, *VR*, *SW)*, polarimetric (*ZDR*, *ϕdp*, *KDP*, *ρhv*), & additional radar derived products available

## 4. Teaching, Research, & Operations

Teaching:

- ULM is primarily an undergraduate teaching university
- Only atmospheric science or meteorology program in LA
- Radar will support two courses in radar met
- Basic undergrad radar met course begins Spring 2016; advance radar met in development
- 5 radar operating & analysis workstations added to atmospheric science teaching laboratory
- Junior & senior students will gain radar operating experience as part of coursework

Research:

- Enhance research capability of Atmospheric Science department
- Research will include: northeast Louisiana rainfall mapping, severe weather, winter weather
- Leverage radar for additional research equipment (e.g., radiometer, disdrometers, etc.)

Operations:

- 24/7 operations
- Adaptable scan strategies (full volumes, sectors, rapid low-level updates, RHIs, etc.) but largely mimic NWS scanning
- low-level surveillance scan only on "non-weather" days
- Live data available to NWS and local Ems (others?)
- NWS request specific scan strategy

## 5. Radar Build

Radar groundbreaking on May 6, 2015

ULM radar antenna testing at EEC's facility

65-ft tower construction began Sept. 1, 2015

Tower complete and radome construction began Sept. 11, 2015

Current Timeline:

- Late Sept: antenna installed & radome complete
- Early Oct: additional radar components installed
- Oct. 26: official site testing begins
- Nov-Dec: various ULM operations and maintenance training
- Jan 2016: radar begins 24/7 operations

## 6. Outstanding Questions

- Official start of radar operations
- Final operations plan
- Data transport to interested parties (e.g., NWS)
- Inclusion in MRMS
- Media and other community partnerships

## 7. Acknowledgements

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