Observations of Precipitating Clouds in the Southern Great Plains Region

Oklahoma Radar Facilities

S-band: Operational WSR-88D Network
                 KOUN Polarimetric (NSSL)
                 MPAR Phased Array (NSSL)

C-band: Polarimetric (OU/EEC)
                      Mobile SMART-R (OU et. al)
                 TDWR (FAA)

X-band: CASA Polarimetric IP1
                 Mobile Polarimetric (NSSL)

Ka-band: MMCR, Central Facility (ARM)

W-band: WACR, Central Facility (ARM)

Profiler: ARM, NOAA

Oklahoma Instrumentation

Oklahoma Mesonet (Oklahoma)
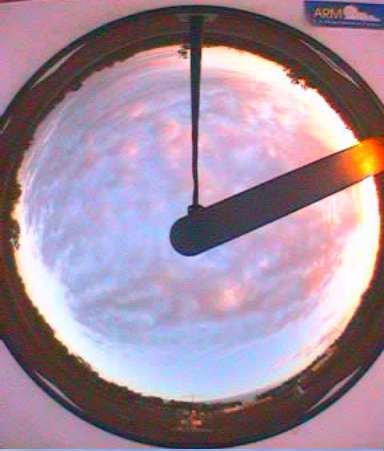
ARS Micronet (USDA)

ARM SGP Facilities (DOE)
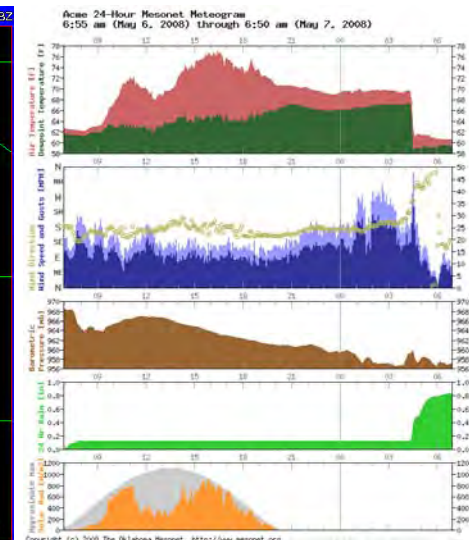
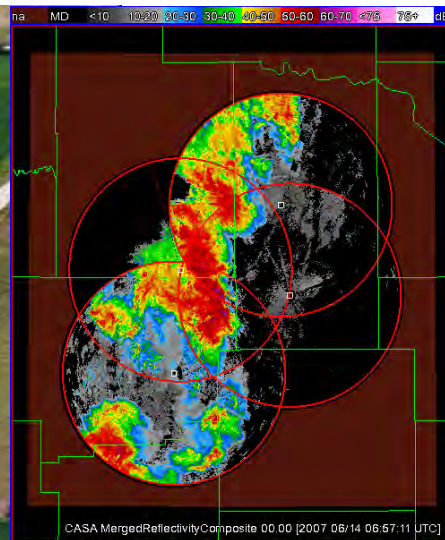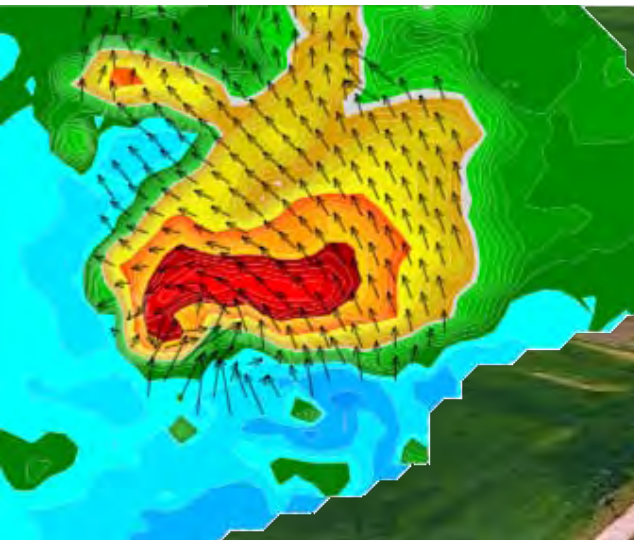Oklahoma Lightning Mapping Array, NLDN
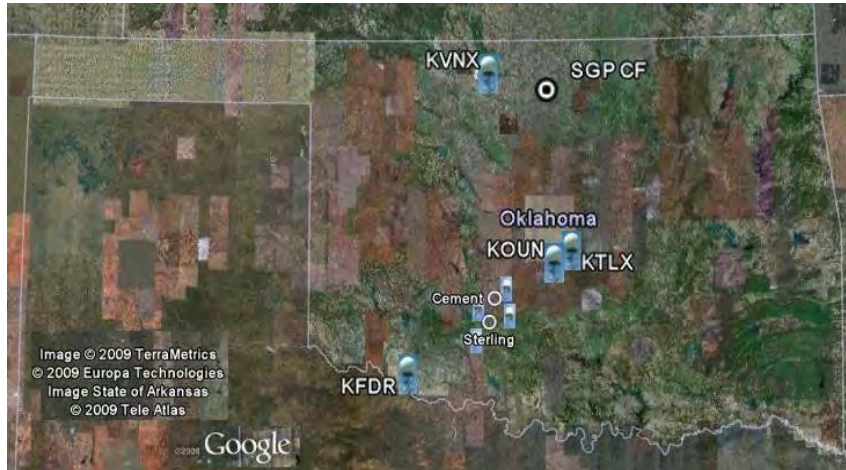
NOAA Profiler Network

Kessler Farm Field Laboratory

ASOS, AWOS, AWSS (FAA/NWS/DOD)

ARM & Oklahoma Dataset Integration: Examples

Oklahoma Radar

❖ CASA radars offer unique 2D/3D wind retrieval capabilities

❖ KOUN offers advanced microphysical insight, echo classification, data quality
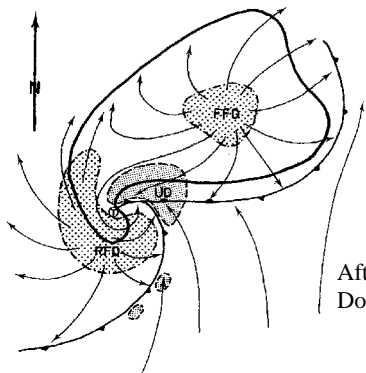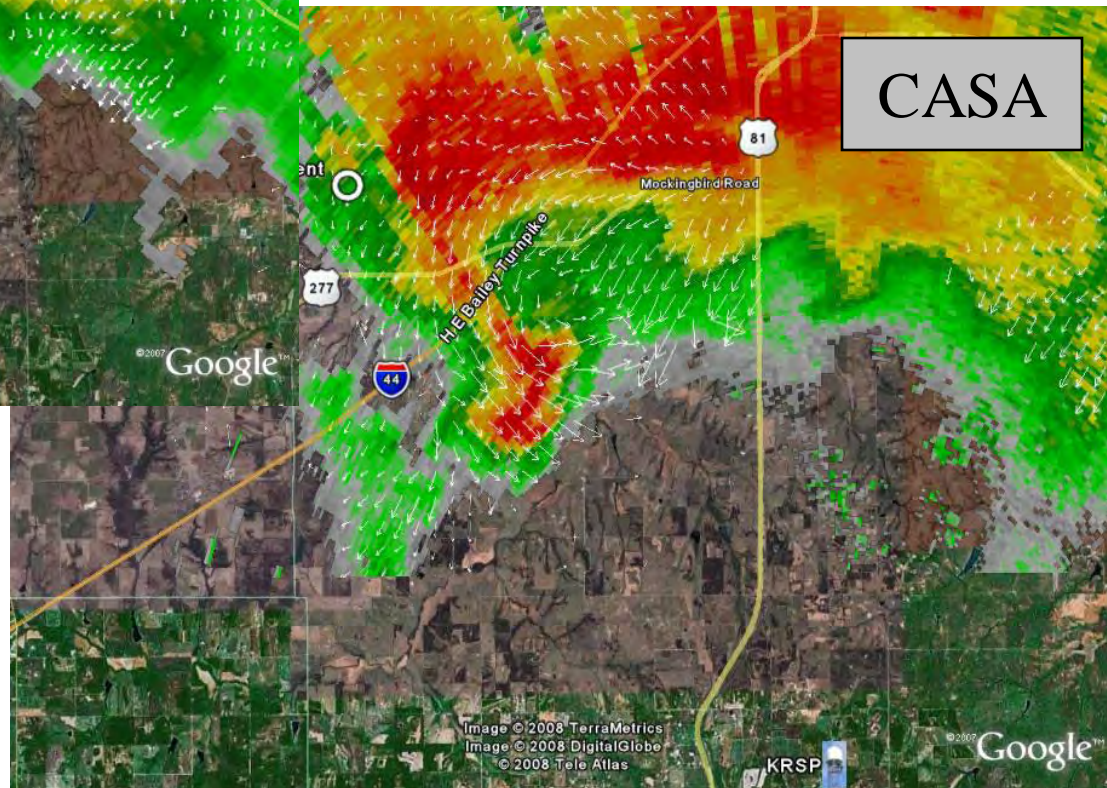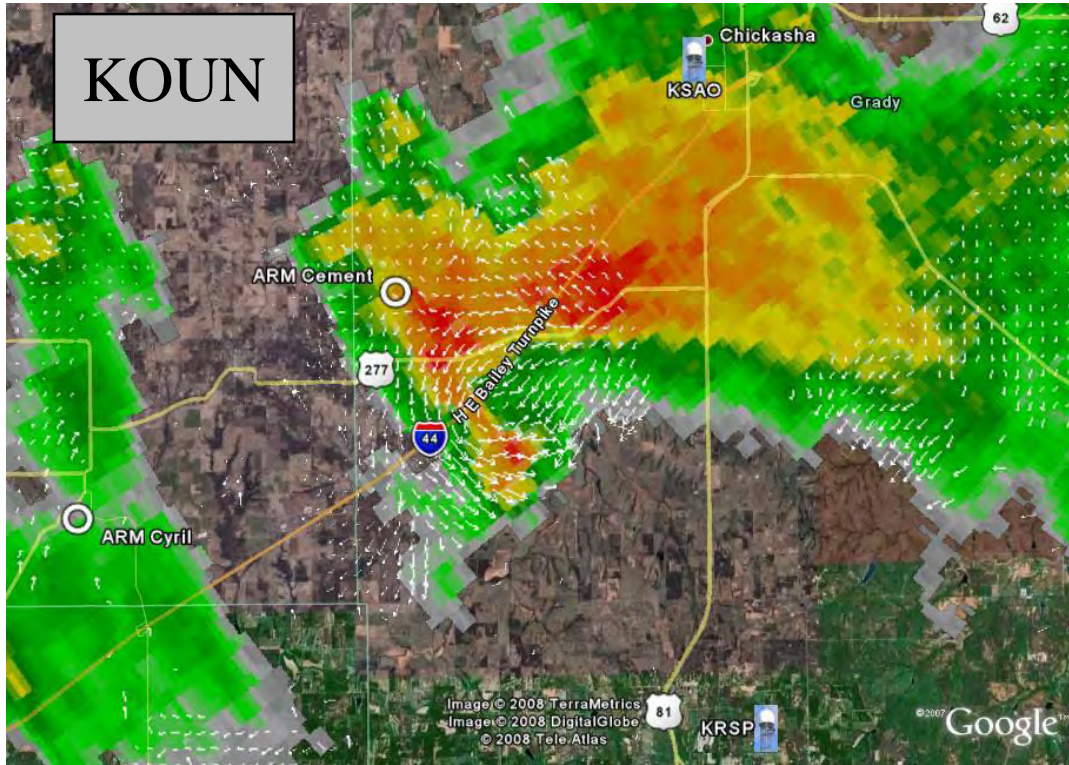
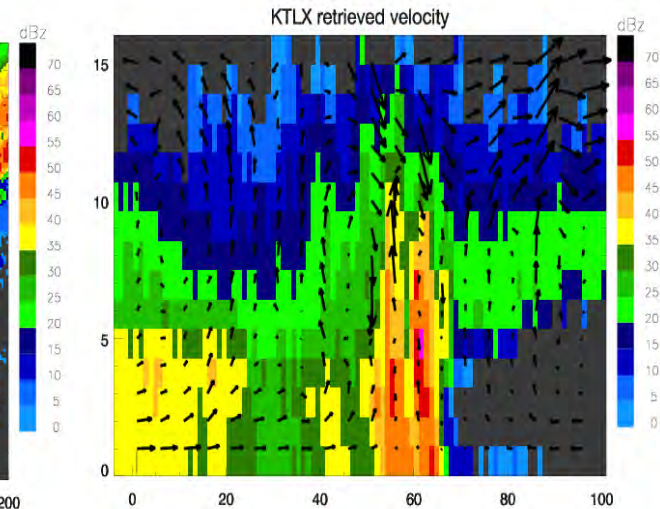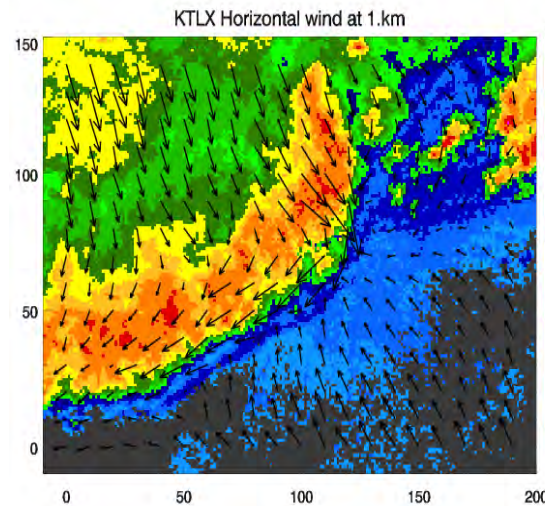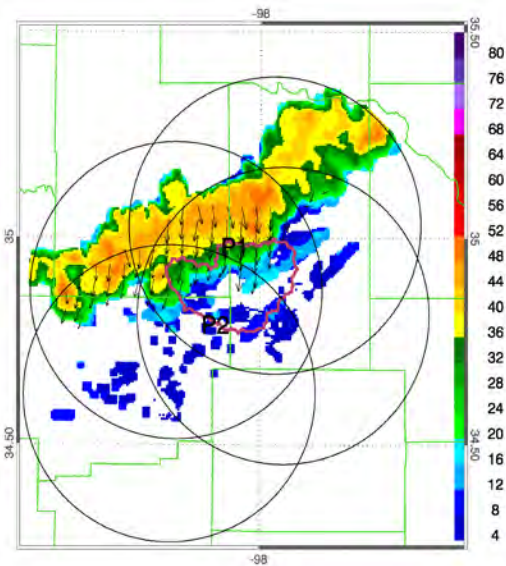❖ Center of CASA IP1 domain highly instrumented

KOUN

CASA

3D Velocity Retrievals

After Lemon and
Doswell (1979)

Multi and single Doppler Wind Retrieval Capabilities, Evaluation

KOUN Z

KOUN HCA

Canadian Mesoscale Compressible
Community (MC2) Model

CASA & KOUN

❖ Direct comparisons of radar time height profiles and additional obs.

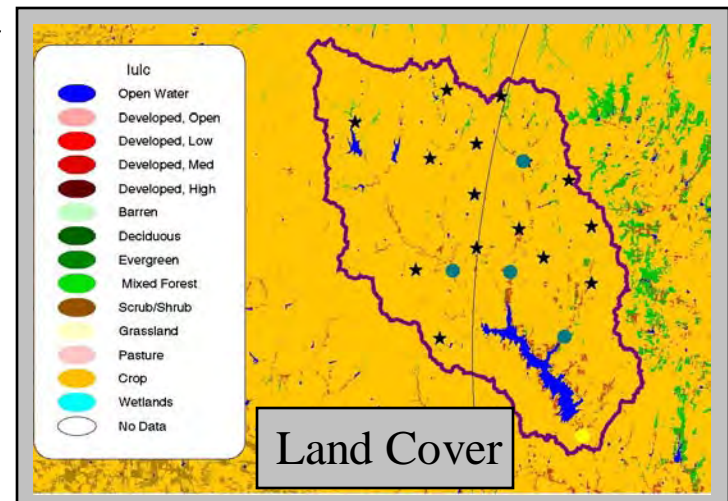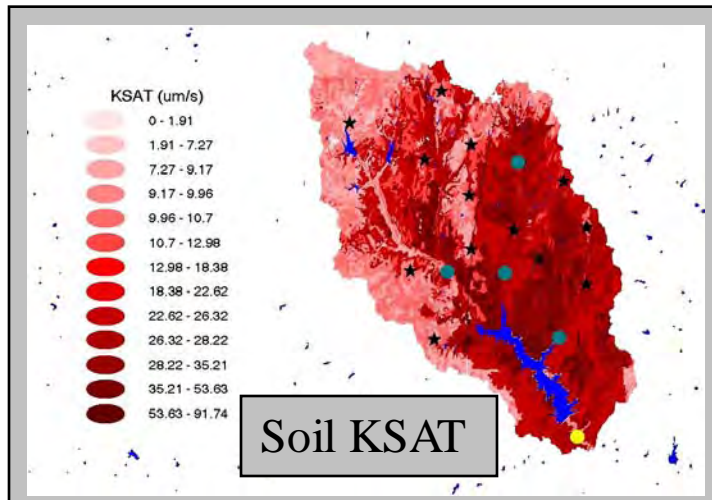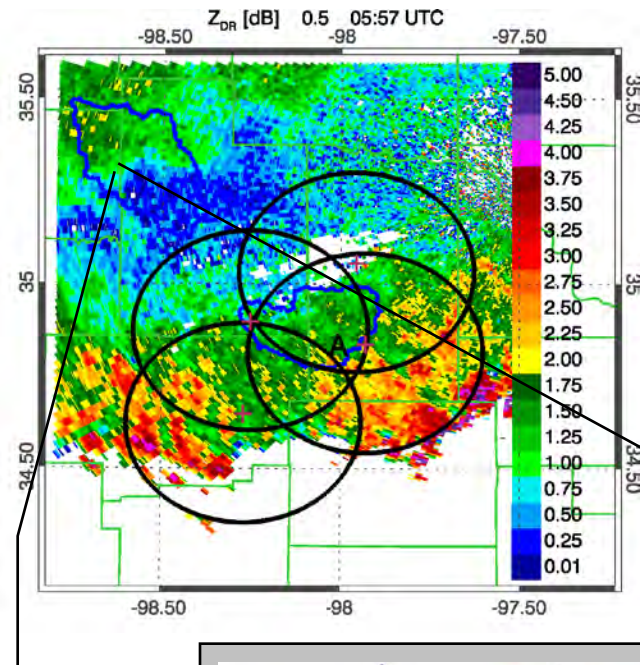❖ Forward radar modeling from model output fields, multi-moment schemes

ZDR [dB]   0.5   05:57 UTC

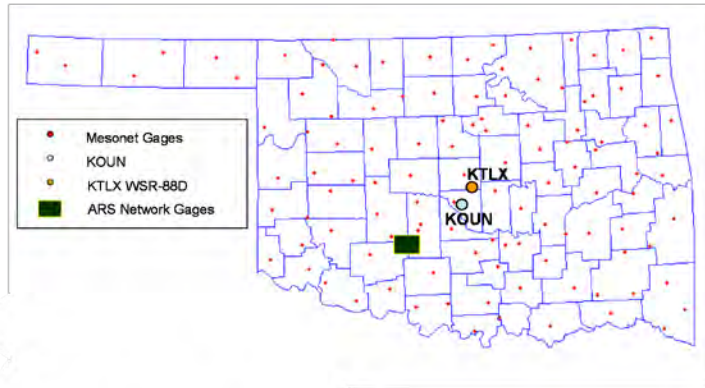# KOUN & Rainfall

❖ Oklahoma Mesonet and ARS Micronets: Potential hydrological applications, storm temp/moisture.

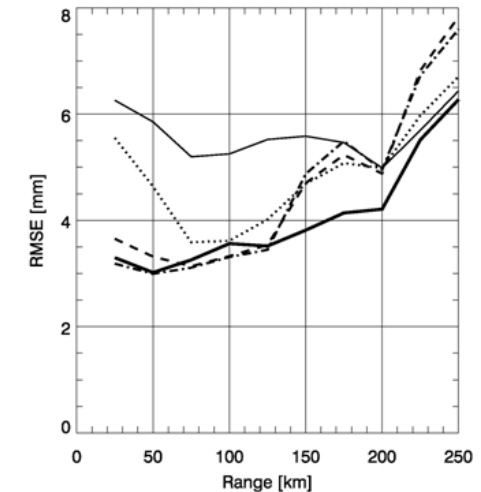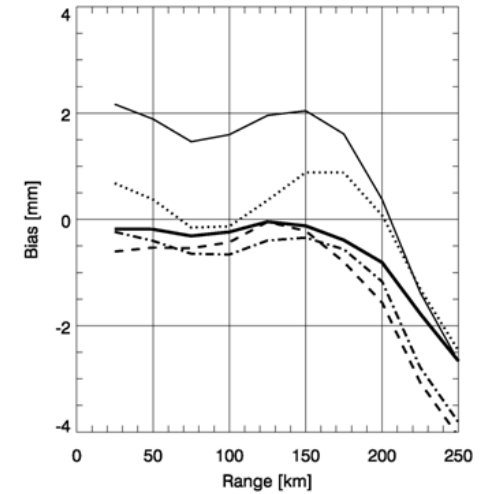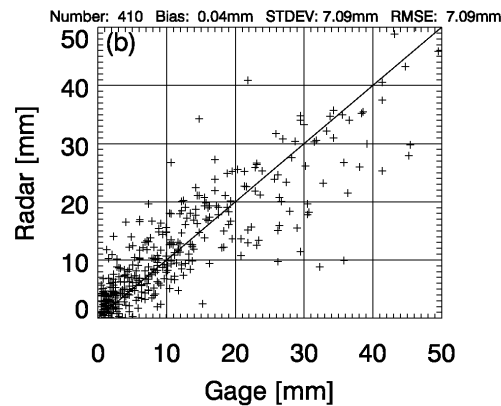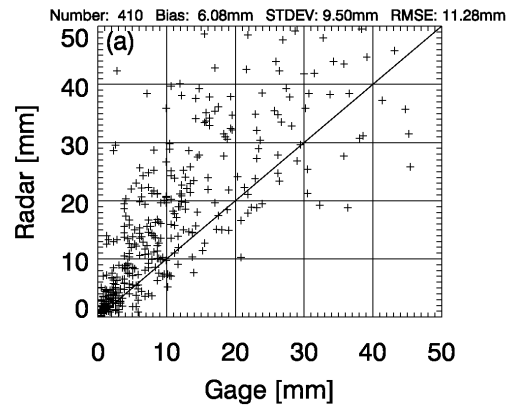❖ Polarimetric radars: Capability for improved precipitation estimation

Soil KSAT

Land Cover

KOUN & Rainfall

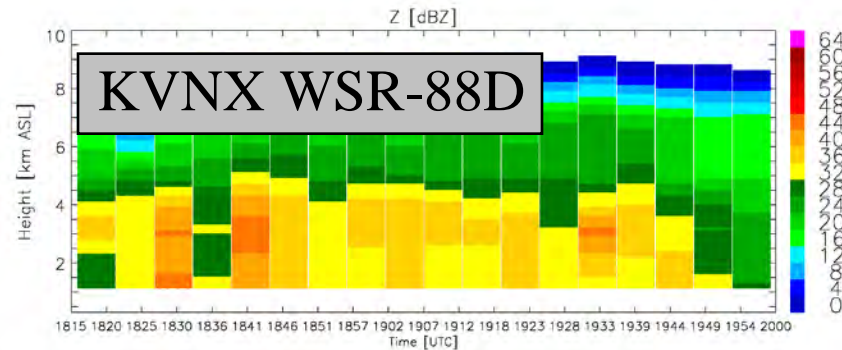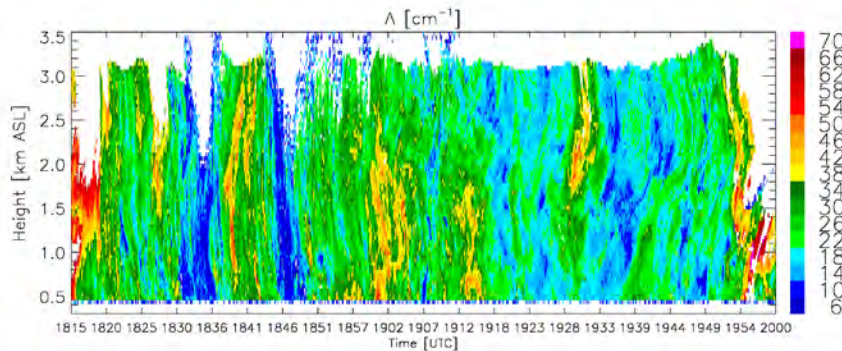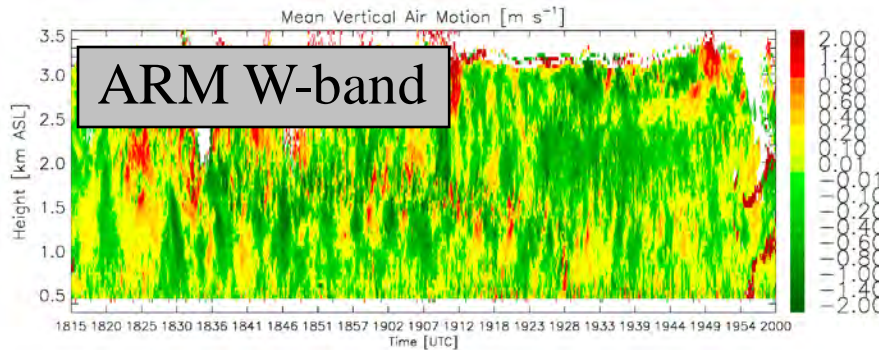Oklahoma Mesonet
Rainfall validation study.
Merged HCA & Rainfall
(e.g., Giangrande and
Ryzhkov 2008)

ARM W-band Retrievals

❖ ARM "Cloud" radar provides detailed insight into precipitation

❖ Applicable in stratiform and convective rain

❖ Compliment to profilers. Validate larger-scale wind retrieval methodologies from scanning radar

Relocated ARM Profiler: Validation