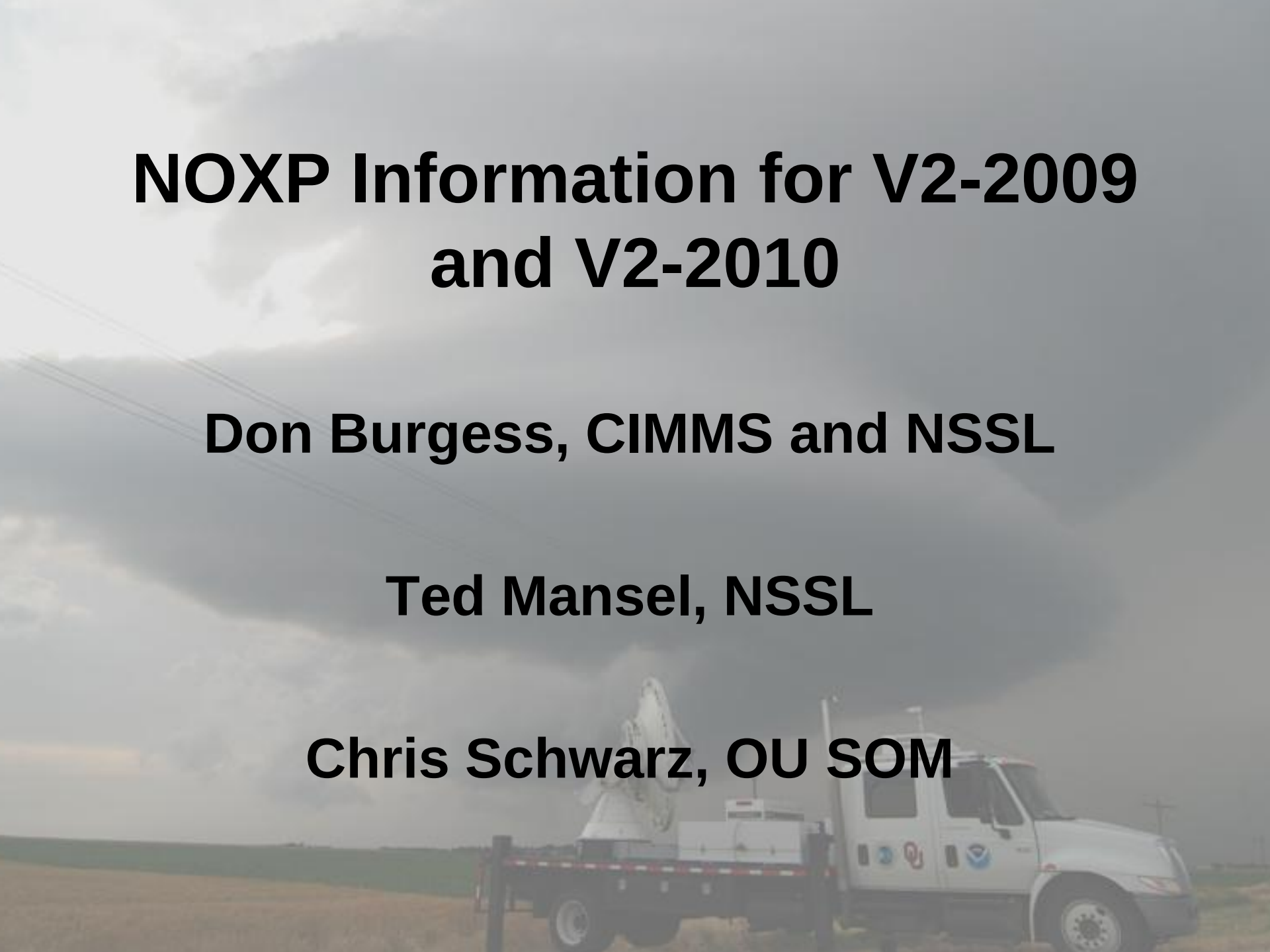
NOXP Information for V2-2009 and V2-2010

Don Burgess, CIMMS and NSSL

Ted Mansel, NSSL

Chris Schwarz, OU SOM



NOXP V2-2009 Data Summary

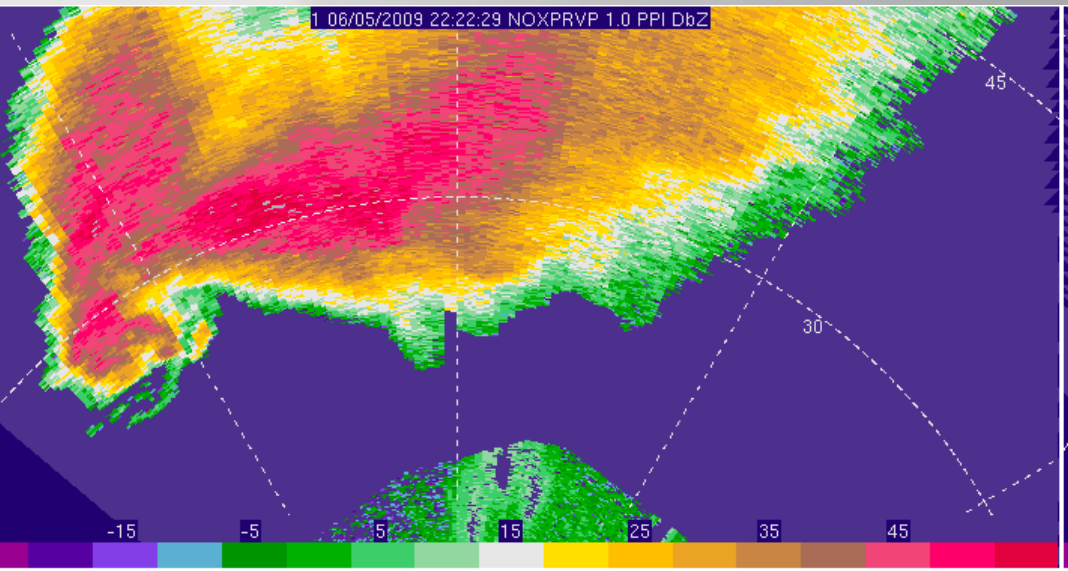
- NOXP had 30 deployments and 1152 minutes of data
  - Data spreadsheet handouts available
- Four cases picked for detailed analysis
  - June 5, 2009 (Goshen Co, WY; 2 deployments, 48 minutes)
  - June 7, 2009 (Northwest Missouri; 2 deployments, 58 minutes)
  - June 9, 2009 (Greensburg, KS; 2 deployments, 53 minutes)
  - June 11, 2009 (Las Animas, CO; 2 deployments, 89 minutes)
- Data editing/correction emphasis has been on those four cases

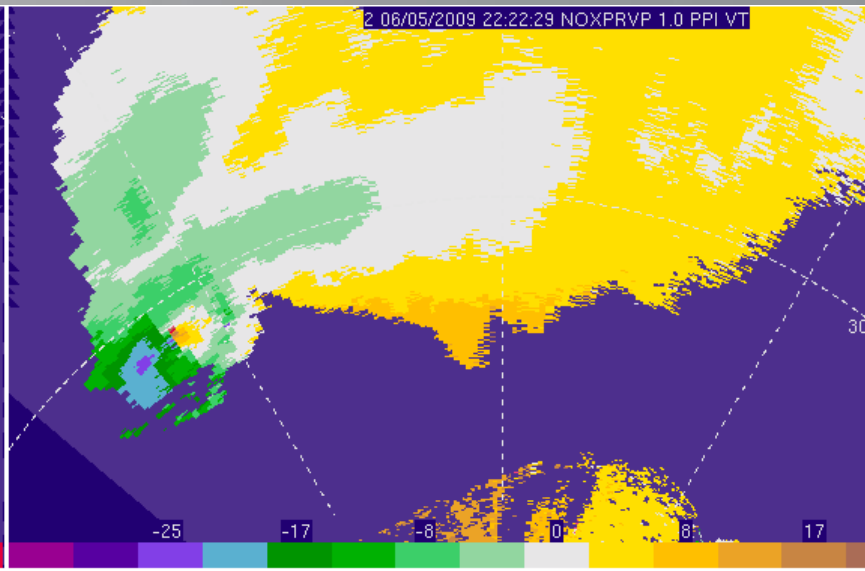
NOXP Data Editing/Correction

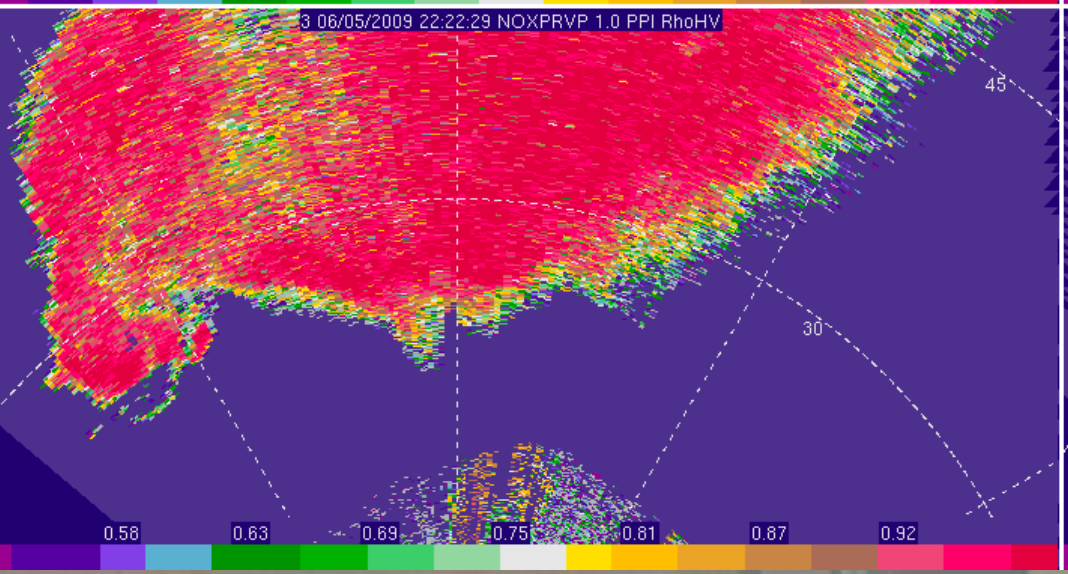
- Data Editing Steps
  - Remove bad data (ground clutter, multi-trip echoes, etc)
  - Dealias radial velocities (Big Job!)
  - Correct digital compass headings/data azimuths
- Data Correction Step
  - X-band data (Z and Zdr) must be corrected for attenuation
  - Correction involves Differential Phase
  - Diff Phase = Propagation Diff Phase + Backscatter Diff Phase
  - We use a one-pass technique (ZPHI; Snyder 2008, 2009)
    - Thanks to Jeff Snyder for his help
  - We will compare to a multi-pass technique (Successive Correction; Melnikov 2009)

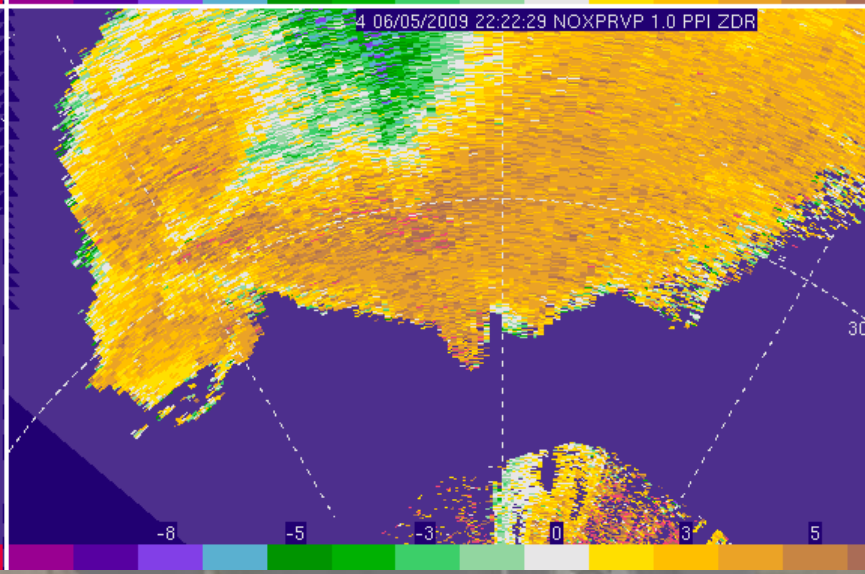
Example of Edited Data (Goshen CO)

222229Z 1.0 deg elevation

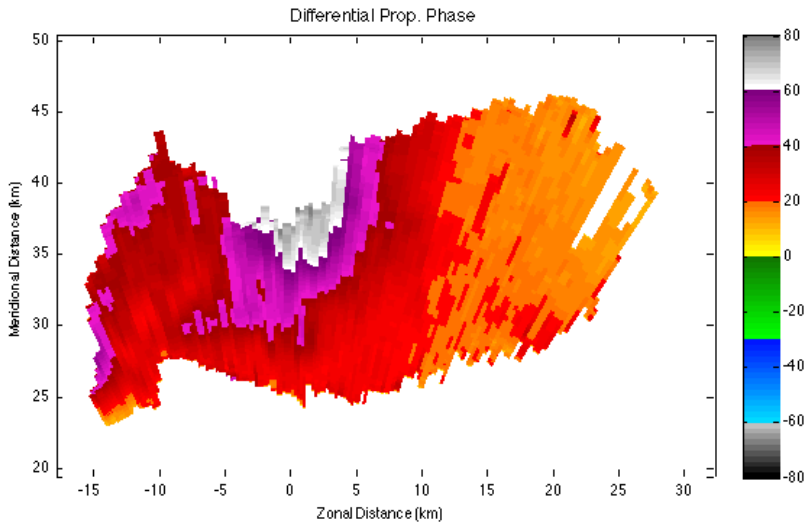


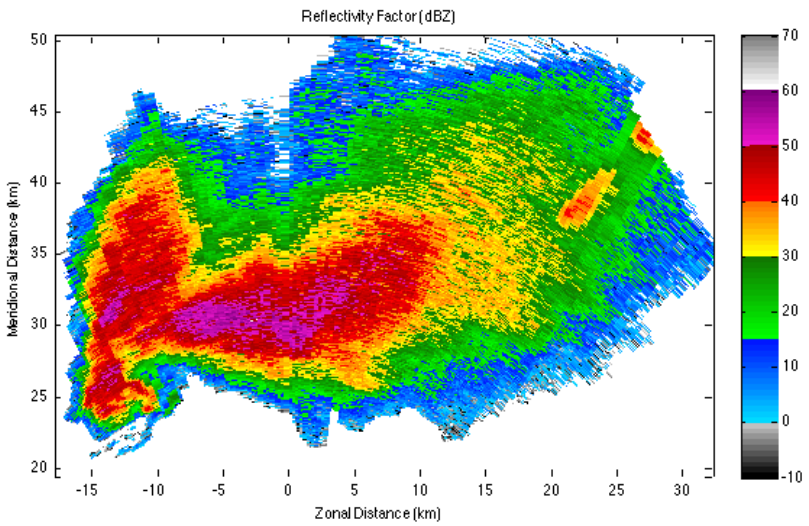


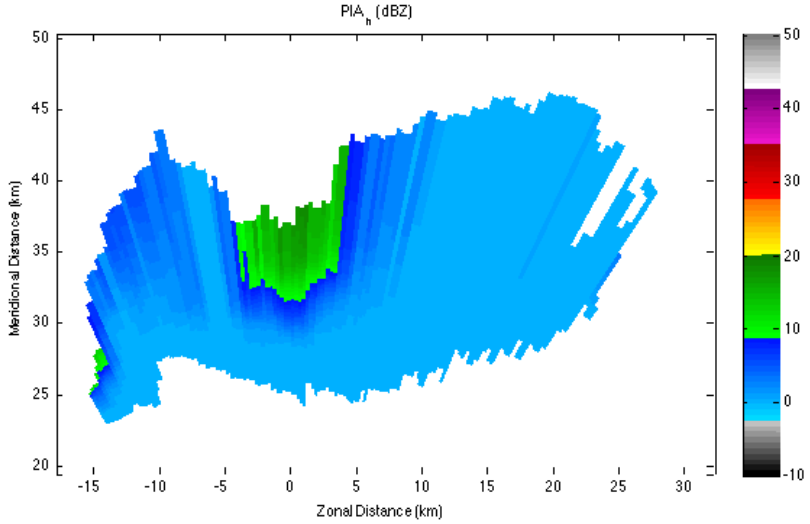


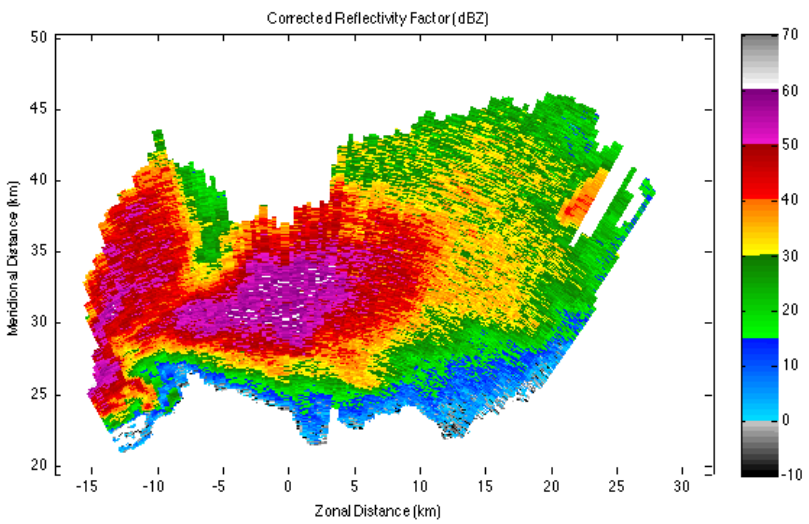


Example of Attenuation Corrected Z (Goshen Co) 222229Z 1.0 deg elevation





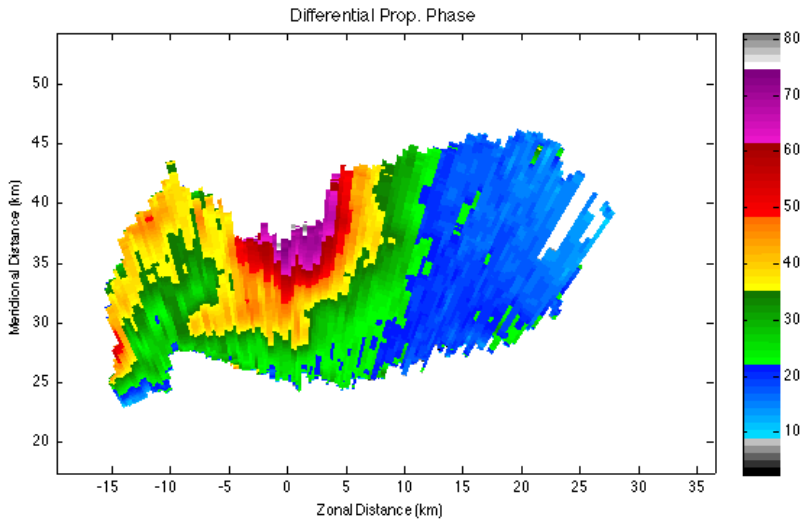


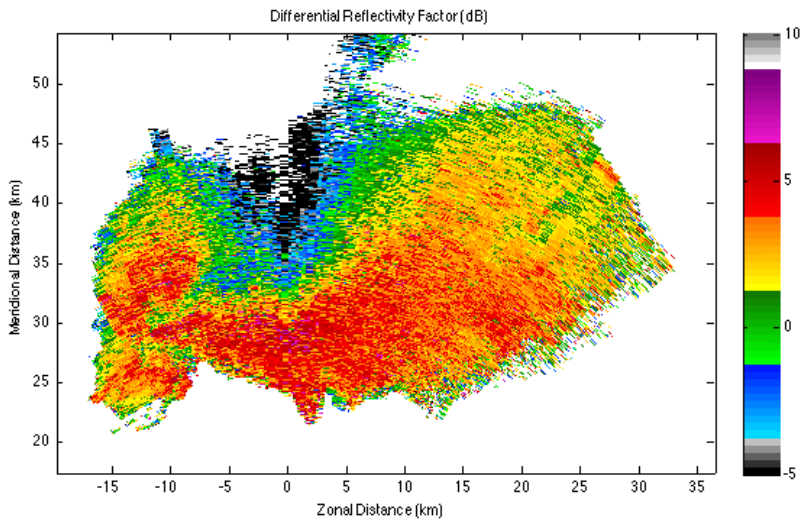


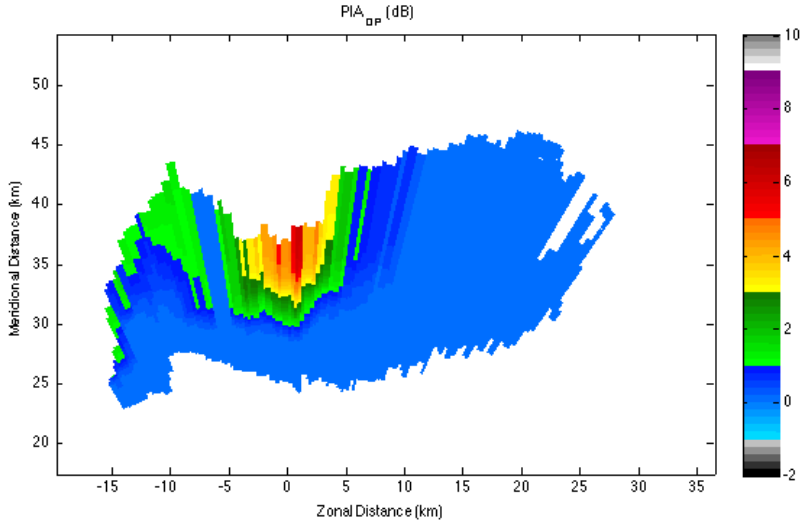
Example of Attenuation-Corrected Zdr (Goshen Co)

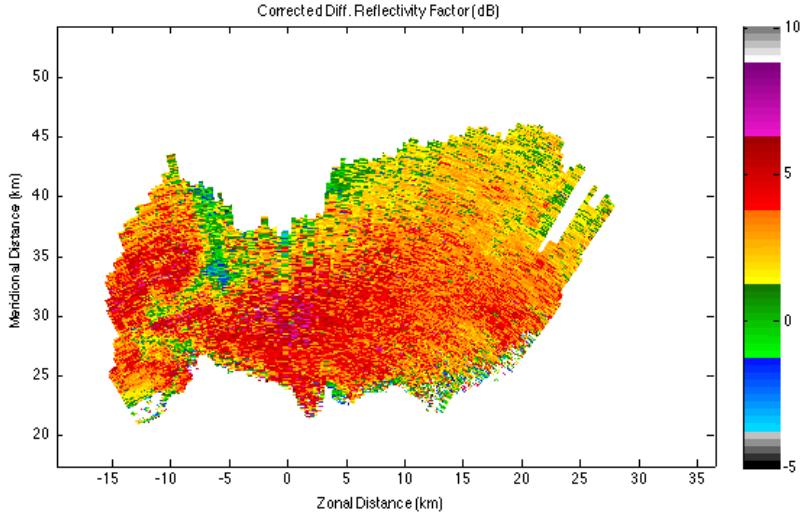
222229Z 1.0 deg elevation

06/05/2009 22:22:29.475 UTC: (0.96681°) - zphi









NOXP Data Edit/Correction Status

- June 5
  - All data edit and correction finished
- June 9
  - All data edit and correction finished
- June 7
  - Data edit partially done
    - Strong winds…severe dealiasing problems (Vnq = 13.6 m/s)
  - Data correction not done
- June 11
  - Data edit partially done
    - Lots of data to edit; some dealiasing problems
  - Data correction not done

NOXP 2009 Data Analysis Plans

- February 10, 2009; Tornadic Supercell
  - Compare X-Band attenuation correction schemes
  - Compare S-band (KOUN) to X-Band (NOXP) Dual-Pol
- Analyze June 5
  - Evolution of radar moments and Dual-Pol variables
  - Compare X-Band Dual-Pol data (NOXP & UMX)
  - NOXP & UMX Dual Doppler in hook echo region
- Analyze June 9
  - Evolution of radar moments and Dual-Pol variables
- Other
  - To be determined

NOXP 2009 Issues and 2010 Fixes

- Issue: **Transmitter Limitations**
  - Slow warm up (950 Hz PRF, Vnq = 7.6 m/s)
  - Failure to run at PRF > 1700 Hz, Vnq = 13.6 m/s
- Fix: A New Transmitter (to be delivered in December)
  - NOXP not back from Winter Olympics till ~1 April
  - New transmitter installation/check-out takes 4-6 weeks
  - NOXP may not be ready for May 1 start
- Issue: **Display Limitations**
  - RPV8: single moment/variable, limited image control, no cursor readout
- Fix: WDSSII
  - Up to 6 moments/variables, complete image control, linked cursers, cursor readout, other bells and whistles
  - Status: installed and in final check-out
- Issue: **X-Band License**
- Fix: In process through NOAA/DOC

NOXP 2009 Issues and 2010 Fixes - continued

- Issue: **Intermittent Antenna Runaway**
  - Several times in 2009 lost control of antenna
- Fix: Workaround: Avoid Certain Commands
  - System software bug, no known correction
- Issue: **Improper Data Sector Configuration**
  - Preset sector size important to elevation angle selection and meeting time sink requirements
  - In 2009 tried to hold sector width to 120 deg.
  - Missed right edge of hook echo on June 7
- Fix: Increase Sector Size
  - In 2010
    - Longer range (30 km): 120 deg sector
    - Shorter range (10 km): 180 deg sector
    - Will mean fewer contiguous elevation angles in VCP
    - Would like to, but won't run in PPI

NOXP Suggestions for V2-2010

- **More Dual-Pol Volume-Scan Days (MS Radars)**
  - Dual Pol VCP: 3-minute time sink, 6 km max height
  - Dual-Doppler VCP: 2-minute time sink, 2 km max height
    - Higher height when radar well ahead of storm location
  - Almost all 2009 analysis data are Dual Doppler VCPs
- **Collect Multiple Data Sets near KOUN (WSR-88D DP)**
  - Assumes KOUN in operational test mode in Spring 2010
    - Upgraded KOUN operating now, system test to begin some time soon
  - Data needed to better understand X-Band Dual-Pol, better understand WSR-88D Dual-Pol in tornadic supercells, better compensate for limited WSR-88D resolution/viewing in warning decision making
  - Plays well with NOAA interest in data near the PAR
- **More Tornadic Supercell Data Collection!!**