MC3E - XSAPR

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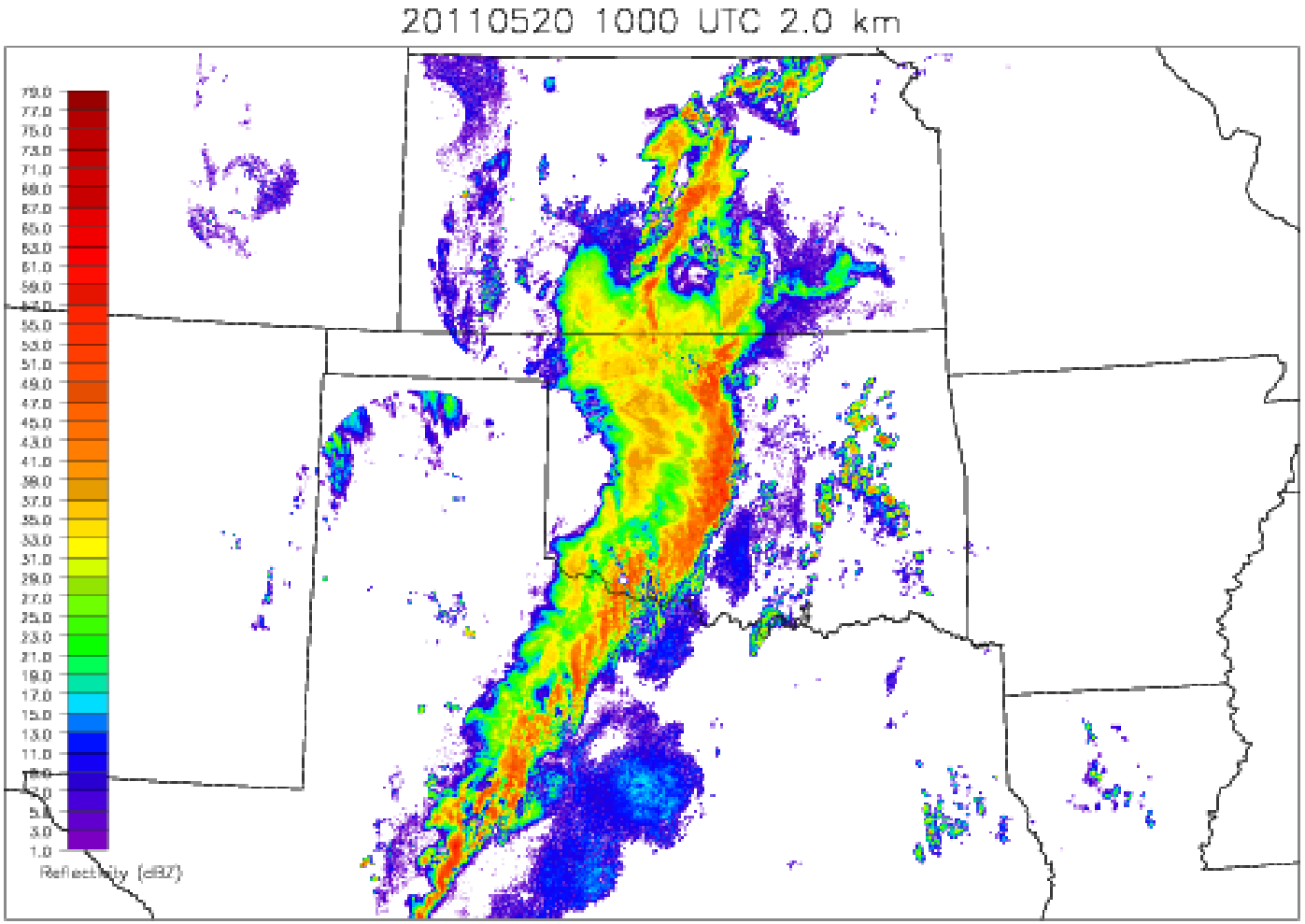
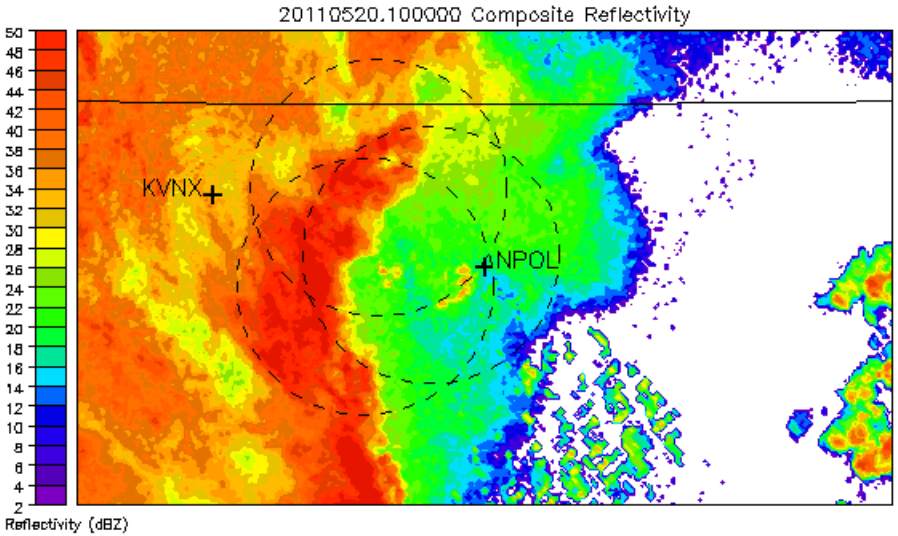
12 September 2011

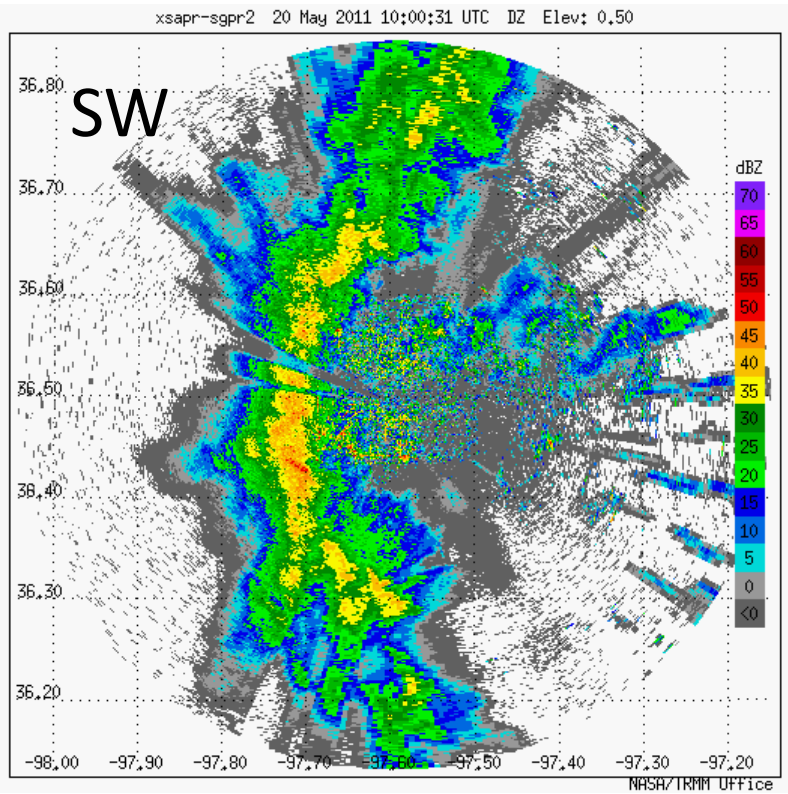
20 May 2011 - Overview

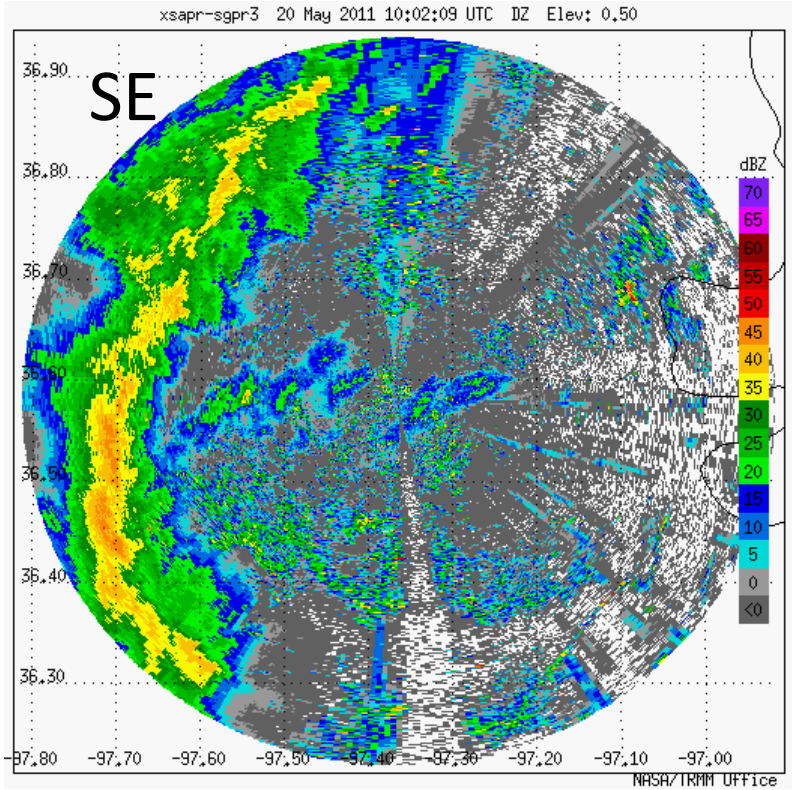


1000 UTC

- Leading convective line

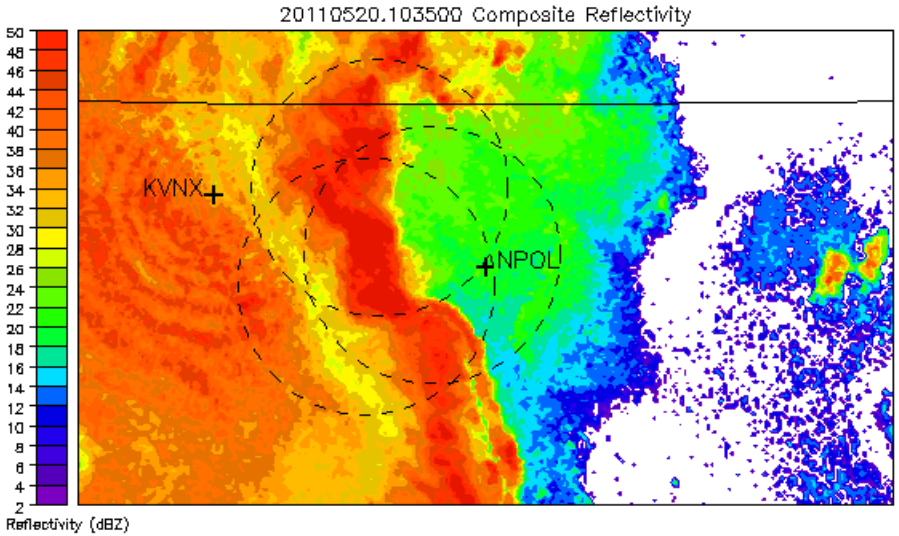


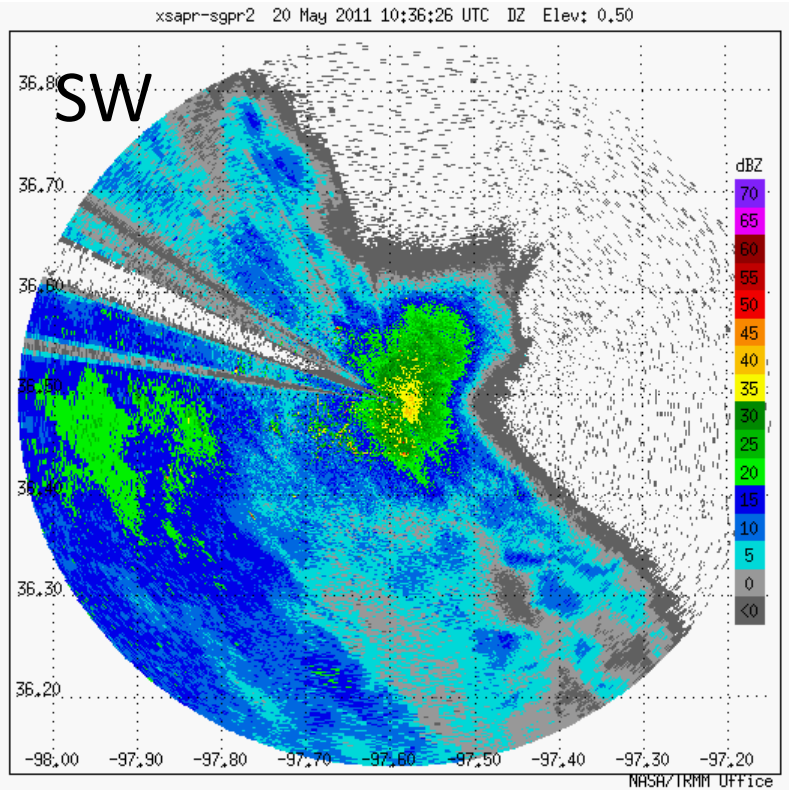


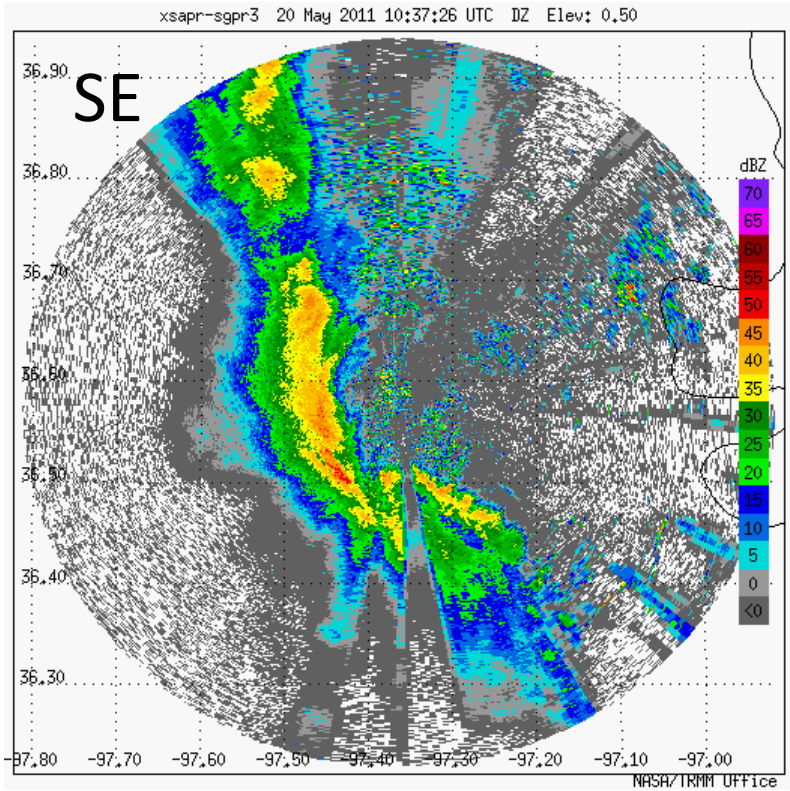


1037 UTC

- Leading convection/trailing stratiform

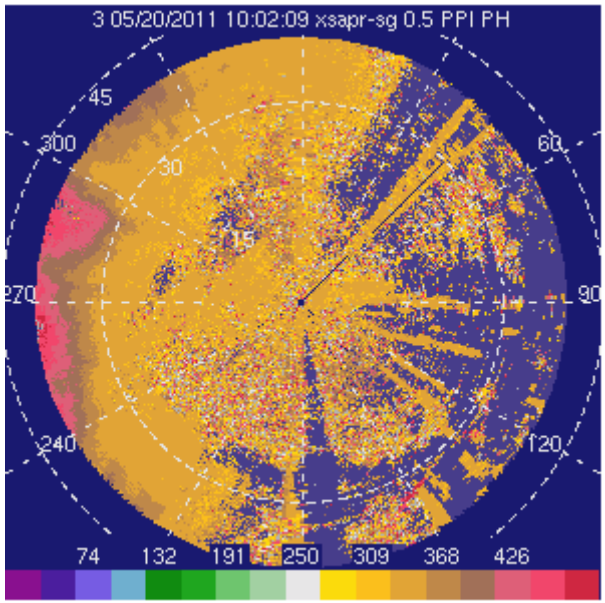


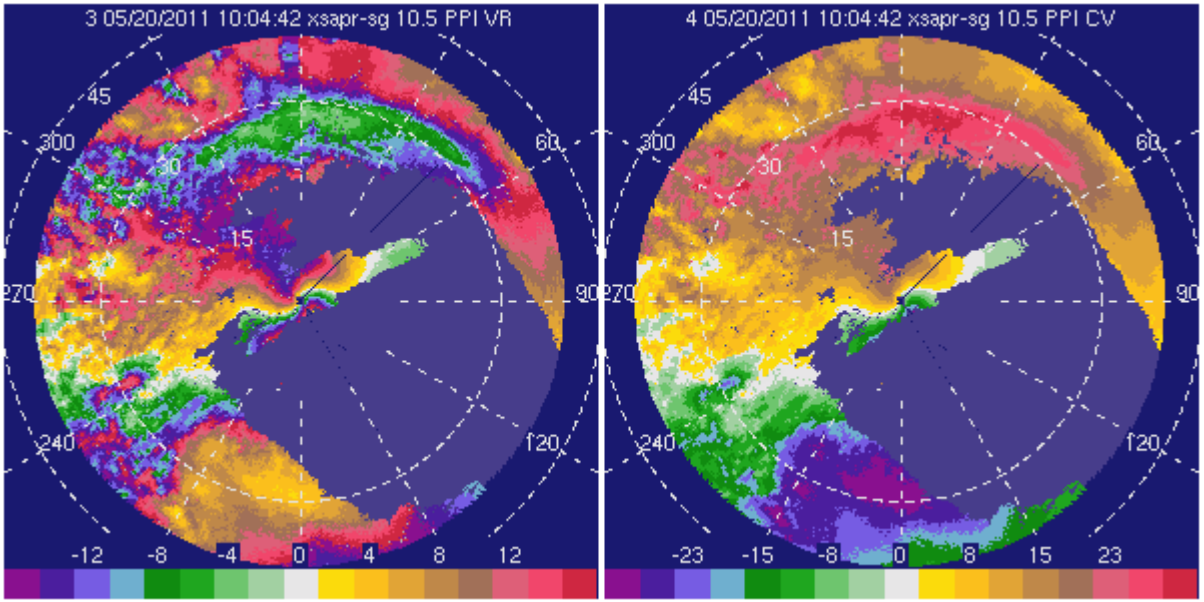




Quality Control

- Phase folding for SE radar
- Removal of non-meteorological echo using the following thresholds for "bad": $\rho_{HV} < 0.7$ and $SD(\phi_{DP}) > 20°$
  - Stratiform case (retain brightband): $\rho_{HV} < 0.4$ and $SD(\phi_{DP}) > 60°$
  - Hand-edited second trip
- Calculation of KDP (Bringi; 150-m resolution)

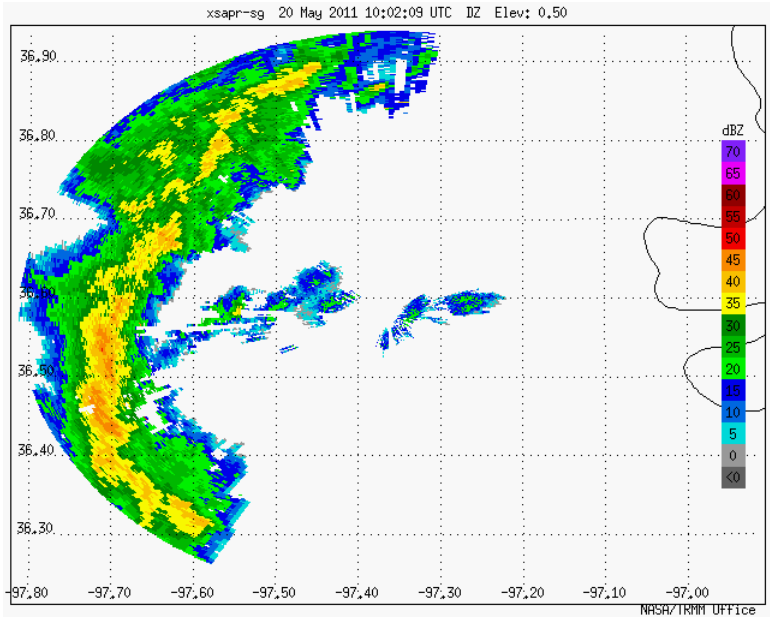


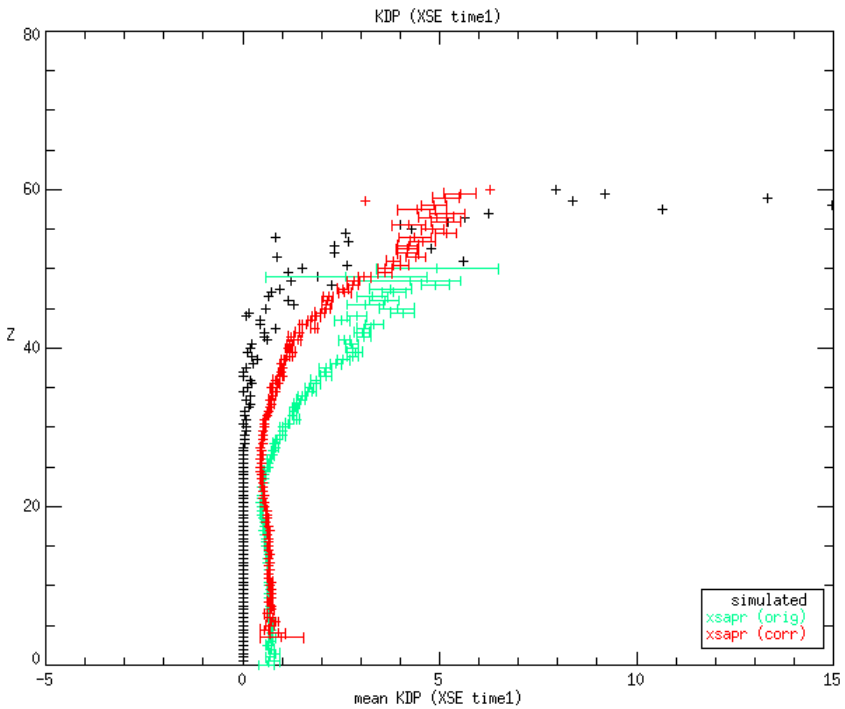


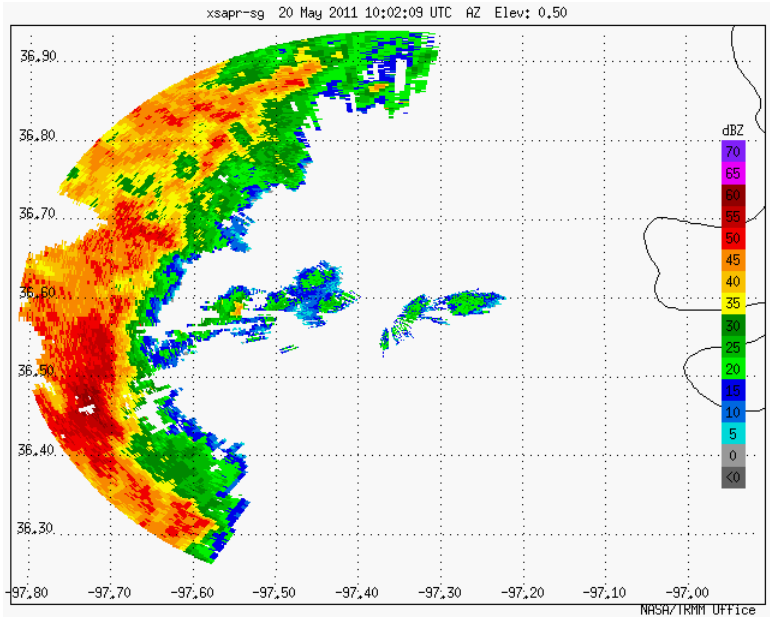
- Velocity folding
  - Nyquist velocity: 17.2 ms^{-1} (SW) and 16.8 ms^{-1} (SE)
  - Correction of multiple folds via hand-editing in SOLO

Attenuation

- Phase-based attenuation correction
  - $Z_H(corr) = Z_H + a\phi_{DP}$
  - $Z_{DR}(corr) = Z_{DR} + b\phi_{DP}$
  - Coefficients comparable to Bringi et al. (1990)
  - Calculated in rain-only regions
- Subtracted system offset phase (estimated): 313° (SE), 113° (SW)



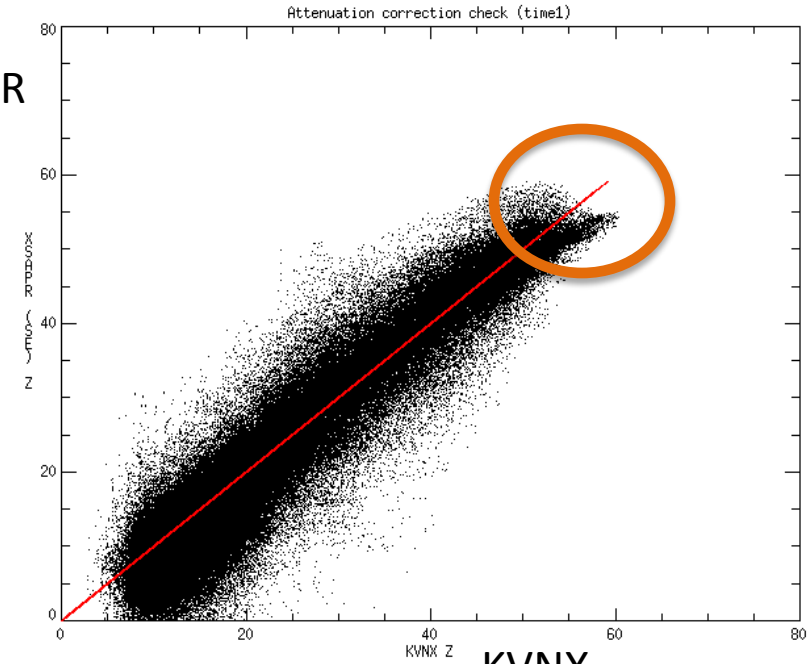




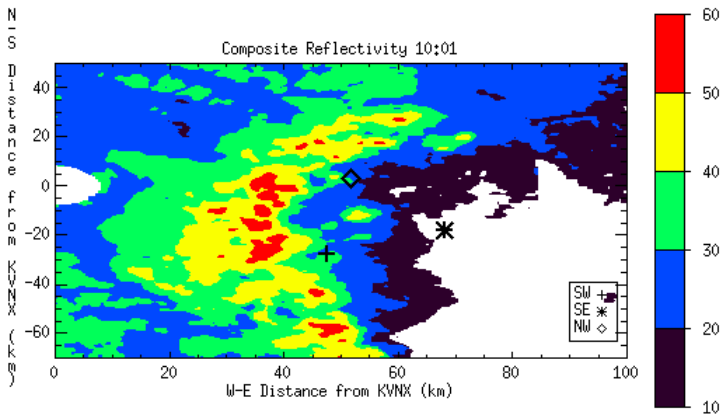
Attenuation

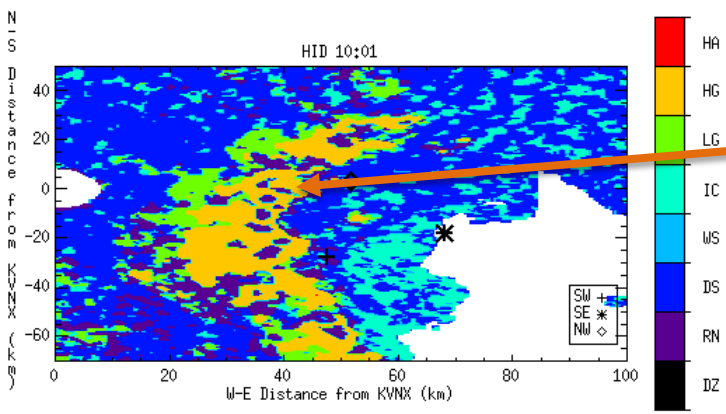
- Comparison with KVNX
- Issues in mixed-phase and ice regions
  - Biggest differences between XSAPR and KVNX when KVNX identifies large, wet ice precipitation (HG, HA)
- Wet radome (ie: SW radar at 1036 UTC)
- Network-based correction?

XSAPR (SE)

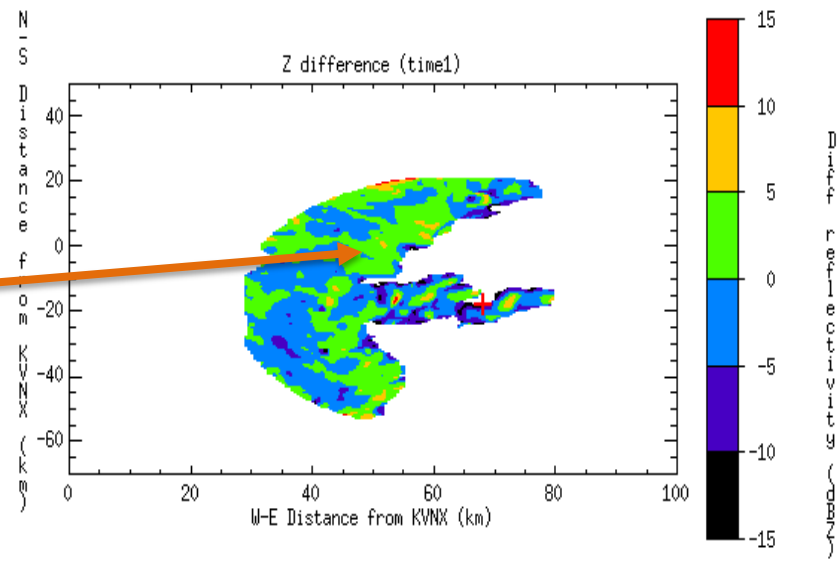


KVNX





KVNX (4.5 km)

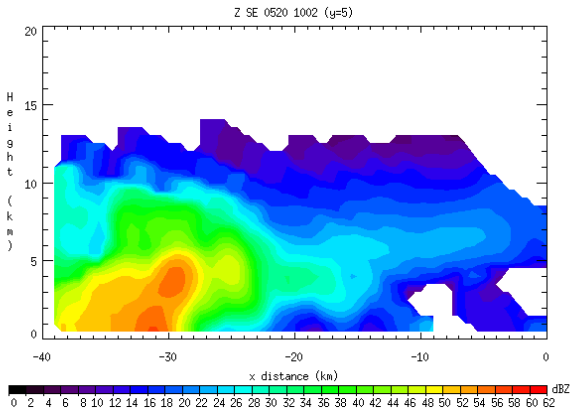


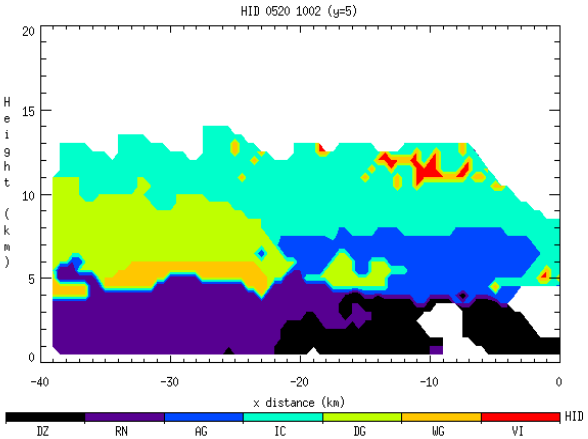
KVNX – XSAPR (SE)

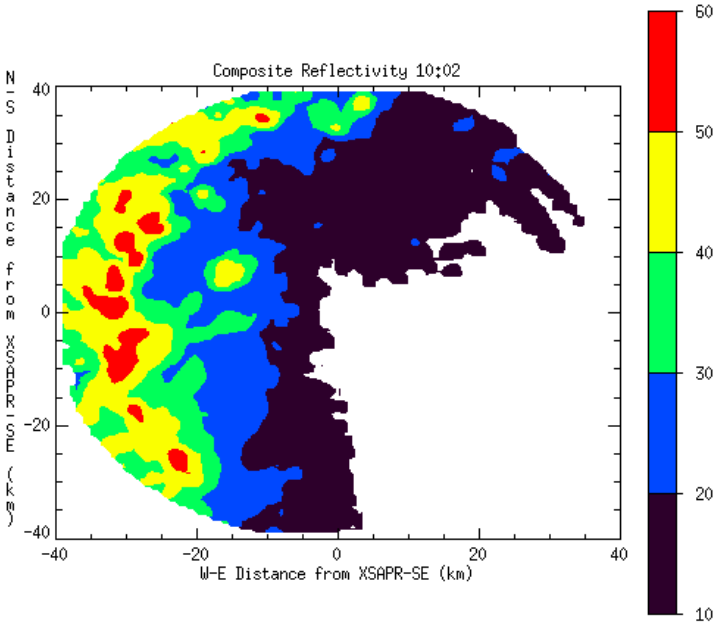
HID

- X-band HID (Dolan)
  - DZ (drizzle, black), RN (rain, purple), AG (aggregates, dark blue), IC (ice, light blue), DG (dry graupel, green), WG (wet graupel, yellow), VI (vertical ice, red)

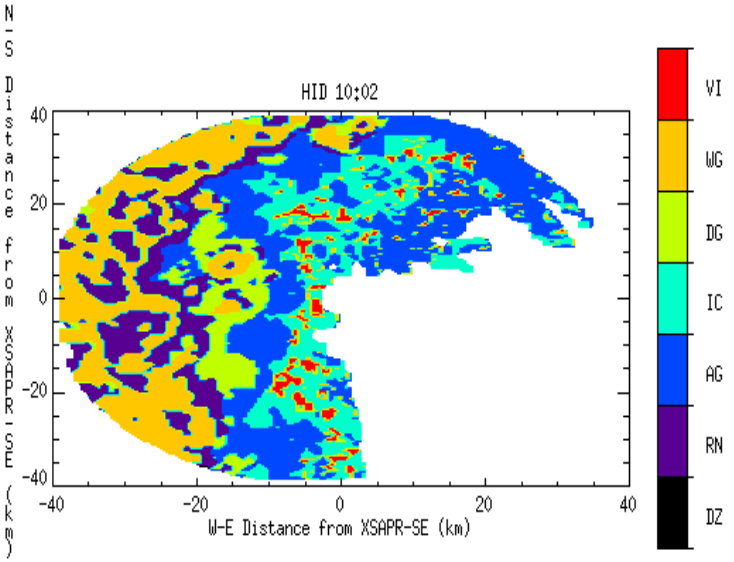
- Uncertainties associated with:
  - Attenuation correction
  - K_{DP} calculation
  - Z_{DR} bias
  - Regions of hail







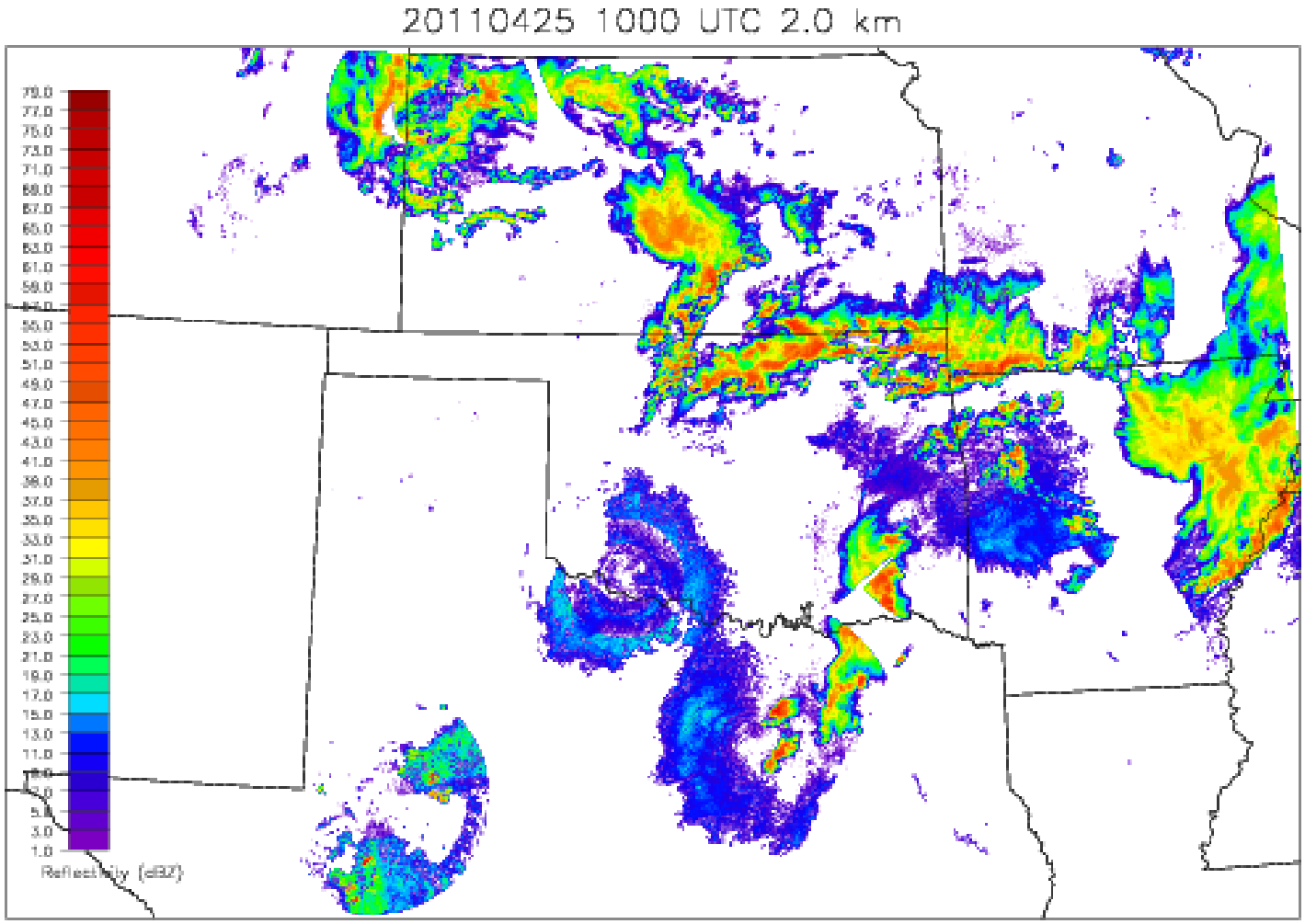
XSAPR (SE) CAPPI (4.5 km)



Summary

- Completed (for SE and SW radar at 1000 and 1035 UTC)
  - Removal of ground clutter, second trip, etc.
  - Unfolded phase and velocity data
  - Gridding data
- Work in progress
  - Attenuation correction (network-based approach)
  - HID
  - Dual-Doppler
- Questions
  - ZDR bias?
  - System offset phase?
  - NW radar pointing error?

Future case – 25 April 2011



Thank you!

Comments? Suggestions? Questions?