P.31 An Updated High Resolution Hydrometeor Analysis System Using Radar and Other Data

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ADAS Complex Cloud Analysis

For many years CAPS has been developing and producing real-time high resolution analyses, storm-scale nowcasts and forecasts.
Two notable applications:

- Storm Scale Ensemble Forecasts for Hazardous Weather Testbed
- Real-Time Analyses and Forecasts for the CASA IP1 & DFW

One element in the analysis product used in these systems is the analysis of hydrometeors:

- Liquid and Ice Clouds
- Rain
- Snow
- Hail and/or Graupel

Adjustments to relative humidity and potential temperature are also made with the aim to provide an initial condition that will support the hydrometers and storm structure.

Recent Updates

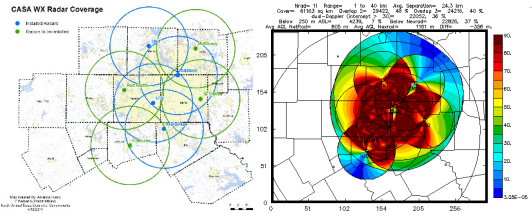
Accommodate new radars

- NEXRAD Dual-Pol Variables (Quality Control and Hail ID)
- New NEXRAD Volume Coverage Patterns (SAILS)
- Heterogeneous X-band Radar Systems in DFW Testbed

Customize for each microphysics schemes in the CAPS Advanced Regional Prediction System (ARPS) and the Weather Research and Forecasting (WRF) forecast systems.

- Lin 5-Class Ice
- WRF single-moment 6-class (WSM6)
- Thompson
- Milbrandt and Yau single-moment
- Milbrandt and Yau double-moment
- Milbrandt and Yau triple-moment

CASA DFW Testbed



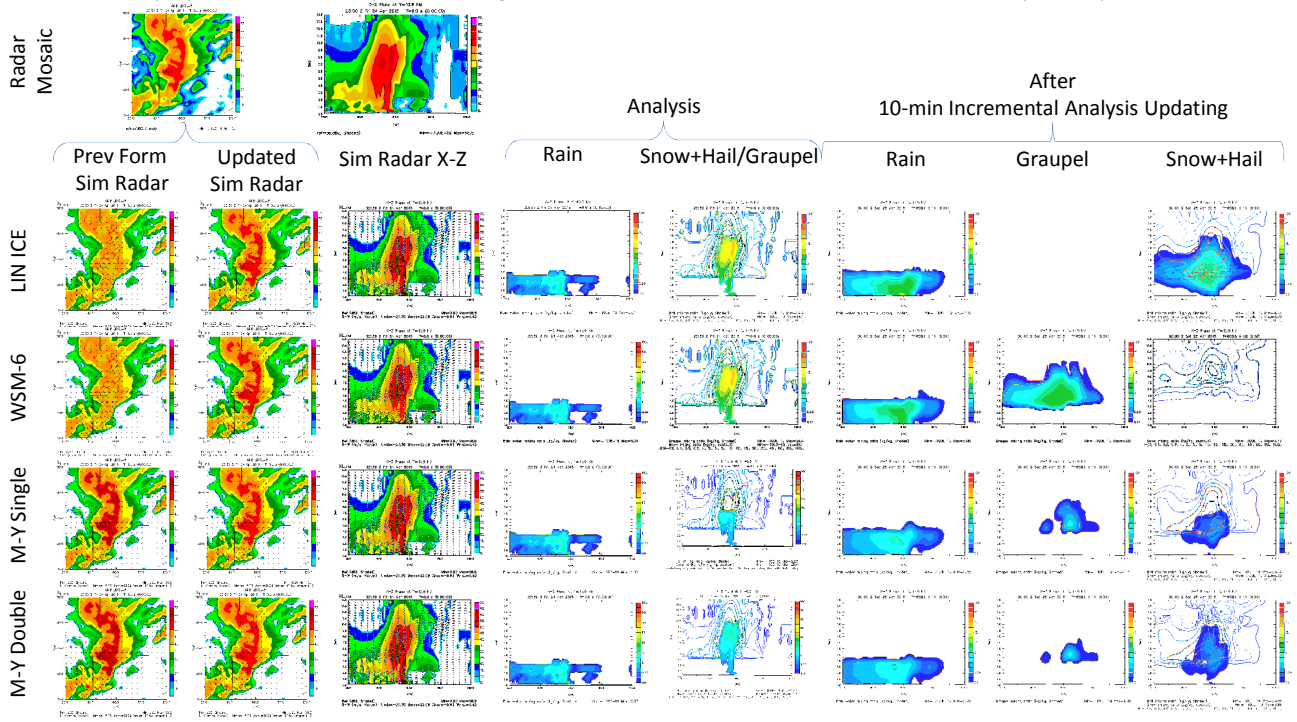
Surface Observations

X-Band Radar Providers

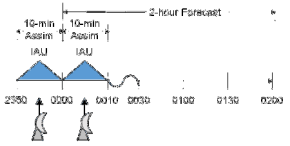
Operations Partners

Customization for Each Microphysics Scheme

Radar Reflectivity Equations inverted to provide mixing ratios consistent with each scheme's assumed or a analyzed drop size distribution



Real-time Assimilation Strategy DFW Testbed 2-h Forecasts



CAPS Real-Time Forecasts Online
http://forecast.ou.edu

Ongoing Work and Future Plans

- Test Impact of cycling step and observe subsequent changes
- Further improve hydrometeor type matching to each microphysics scheme
  Hail/Graupel Separation
- Test delaying hydrometeor insertion in IAU
- Define and measure a hydrometeor change "noise" metric
- Verification of storm and rotation tracks
  Derick Stratman talk, 13A.6, Thursday Morning 11:45 am
- Impact testing of EarthNetworks, GST MoPED and other new observations
  Fred Carr talk, 15B.1, Friday Morning 08:00 am

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