1. Background

**Goal:** Compare simulated precipitation and reflectivity from 3-km regional FV runs to that from NMMB runs - UT cases for which the NAM CONUS nests struggled or did well.

Regional domain used in all FV3 simulations is shown on the right.

2a. Precipitation. Alta, UT Winter Case

- All NMMB runs produced heavy precipitation over Alta, UT with FV3 runs producing much lower precip closer to what was observed.
- Time series shows the FA microphysics produced nearly 1.5” of precipitation over Alta, UT with < 0.2” observed.

2b. Precipitation- July 1, 2015

- NMMB runs produced large areas > 4” in MO.
- FV3 runs generally had lower amounts.
- FV3 runs better handled lighter precip in the NW part of domain.

3. Convective Mode. Moore, OK Tornado Outbreak

- All NMMB runs better captured the mode while FV3 runs were too linear.
- GFDL microphysics (mp) run using the Stoelinga-based algorithm for reflectivity had too broad an area of > 50 dBZ, while reflectivity calculated from the mp was too weak.

4. Reflectivity Algorithms

- NMMB and FV3 runs that calculate reflectivity in the microphysics indicate highest reflectivity extending to the surface.
- FV3 GFDL mp run that uses the Stoelinga-based algorithm has a broad area of > 50 dBZ reflectivity mostly above the melting layer and agrees the least with observations.

5. Summary

- Precipitation in the cold season event over Utah was heavier in the NMMB and with the FA mp scheme.
- Isolated rainfall amounts of 0.21” over 48h were observed in the FV3 runs of the July 1, 2015 case with much lower amounts in the NMMB runs closer to observations.
- Convective mode was better resolved in the NMMB runs for the Moore, OK case with the FA mp similar to observations.
- The Stoelinga-based algorithm provided by GFDL produces a much higher reflectivity than the algorithm computed directly in the microphysics scheme.
- Future work will evaluate the NAM CONUS nest physics in 3-km FV3 runs for various cases, and compare against the WSR88D, TRMM, and GPM mp schemes.