Dynamo limited area modeling activities

➢ **Free-running limited area modeling, constrained by global re-analysis at lateral and lower boundaries**

➢ **Cloud-system resolving modeling with large scale dynamics derived from sounding array network (many models configured as this)**

➢ **Mesoscale modeling (WRF) with an advanced data assimilation component – regional reanalysis product**

➢ **Single column modeling with parameterized convection**

➢ **More ?**

Dynamo limited area modeling activities

Free running limited area models + global reanalysis	**Hindcast experiments, most common but least constrained, test bed for microphysics and radiation**
CSRM + large-scale forcing	**Constrained by large-scale dynamics either imposed or parameterized**
Mesoscale modeling + data assimilation	**Constrained by on-line data assimilation cycles, critical for filling mesoscale gap between clouds and the MJO scale**
SCM + large-scale forcing	**Constrained by large-scale forcing, test bed for developing convective parameterization schemes**

Diagnostics

✓ **Quantities from the forcing dataset and other observations excluding radar: dry/moist static energy, precipitable water, radiative fluxes (short and long wave), surface fluxes**

✓ **Quantities available from radar observation: cloud populations, echo structure, radial winds, convective/Stratiform ratio …**

✓ **Other Important quantities: cumulus fluxes, entrainment, cold pool, updraft, mesoscale organizations**

✓ **A challenge (among others): how to validate model simulated dynamical fields (e.g., 3D winds, divergence and vorticity) using observations?**

A possible CSRM inter-comparison project:

➢ **Employ different forcing datasets**

➢ **Break into several episodes (2?) to minimize uncertainties associated with sounding array setup**