Evaluation of MMF using CAPT

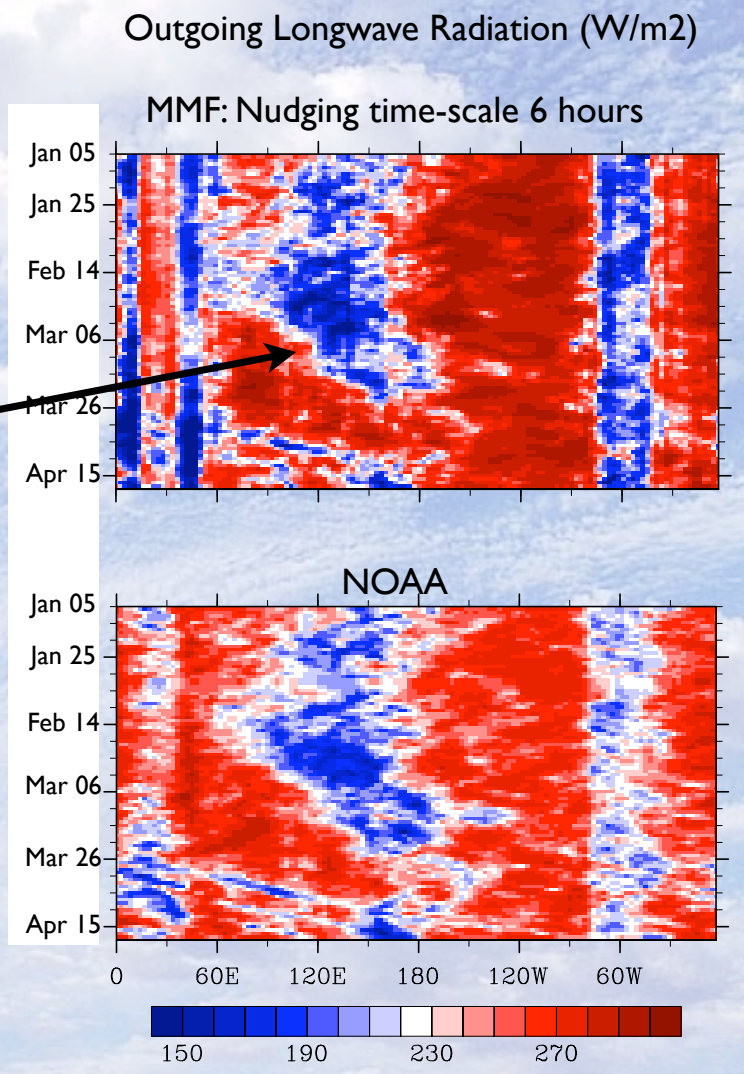
CAPT = CCPP-ARM Parameterization Testbed

CCPP - Climate Change Prediction Program
ARM - Atmospheric Radiation Measurement Program

- In a nutshell, CAPT is a way of testing GCMs in weather forecasting mode;
- CAPT reveals model biases in short simulations hence avoiding complexities of large-scale dynamics and local-physics interactions;
- CAPT allows case studies of specific phenomena, for example, MJO-events using high-frequency point observations such as ARM;
- Relatively short CAPT forecasts provide very economical framework for MMF evaluation
- The standard version of CAM will also be subjected to the same forecasts as MMF

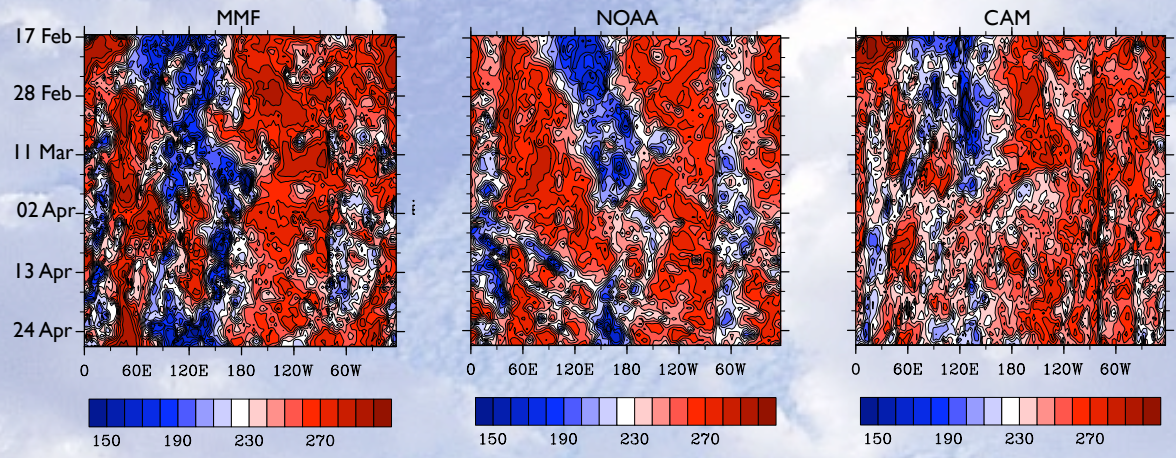
MJO hindcasts using MMF-CAPT

- **Create continuous initial conditions by nudging the GCM grid-scale U, V, T, Q, and PS to ERA-40 or NCEP reanalysis over duration of an MJO event**
- **Clouds are not nudged but simulated by MMF**
- **CRM fields are also saved, thus, no CRM spin-up during forecast initialization is needed**
- **Created initial conditions will be used to branch out forecasts during any stage of an MJO using a free running MMF**

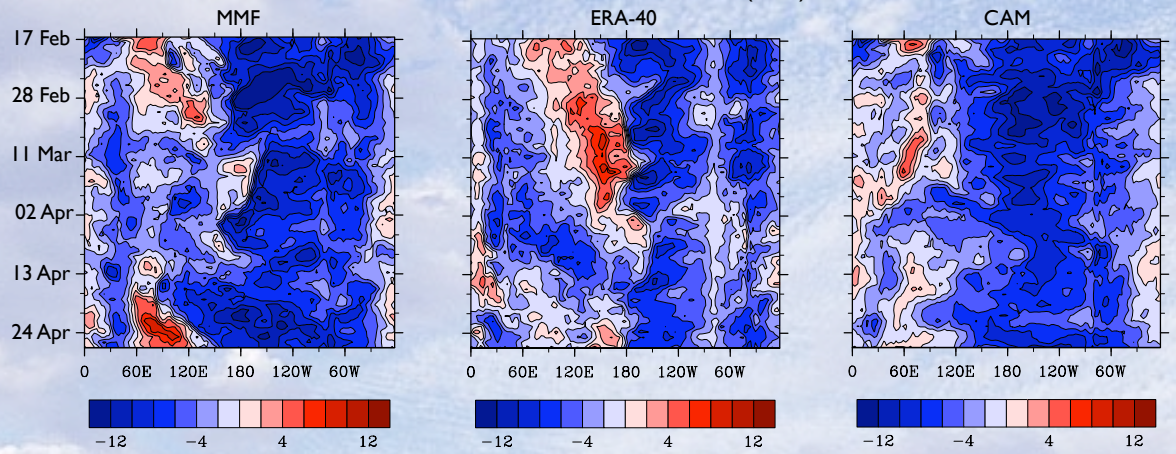


Preliminary MJO forecast using MMF and CAM

Outgoing longwave radiation (W/m^2)



Zonal wind at 850 mb (m/s)



MMF is able to maintain the observed structure of MJO for a week or more.
CAM tends to suppress westward MJO propagation.