

Low cloud breakout

Agenda

Brian Medeiros, Progress on aquaplanet forcing

Peter Blossey, Low cloud feedbacks in MMF

Anning Cheng, Effects of resolution on PBL clouds

Tak Yamaguchi, LESs of CTEI

Aquaplanet forcing

Brian Mediros, Cara-Lyn Lappen, Bjorn Stevens

Goals:

- ▶ Develop a rich forcing data set from aquaplanet simulations for use in SCM/CRM/LES. Focus is on regimes where cloud response is most important.
- ▶ Use this framework as an SCM testbed for evaluating conventional parameterization.

Today: Preliminary work with sCAM

- ▶ How well can the SCM be used to represent the behavior of the full GCM? (Both in standard runs and SST+2 experiments.)

Set up: the forcing

Use output from CAM aquaplanet simulation

Follow the “APE” conventions

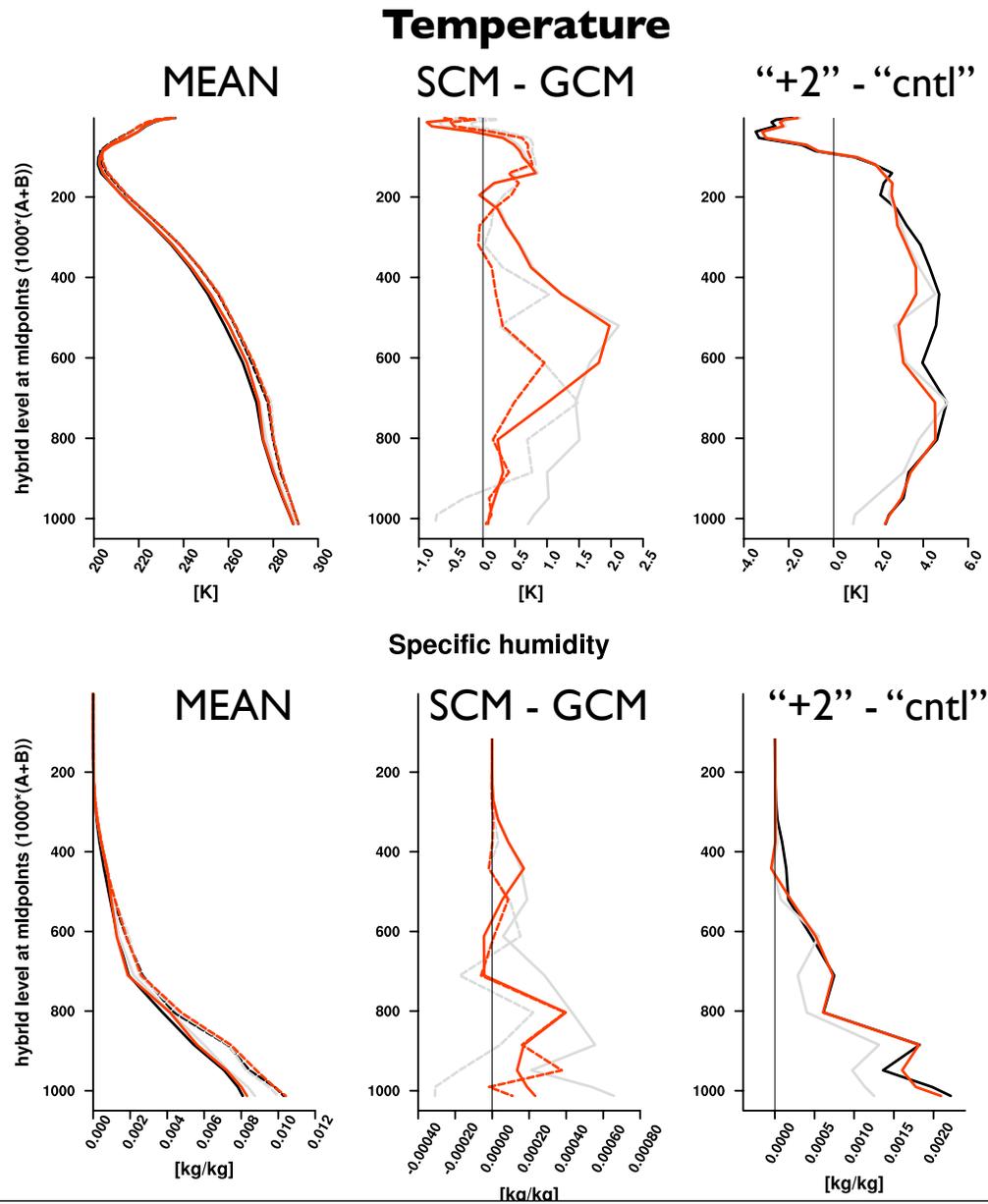
- ▶ SST (simple function of latitude)
- ▶ Ozone distribution (height, lat)
- ▶ Aerosol, Constituent concentrations
- ▶ physical constants (small adjustments)

Output forcing every timestep for some grid point(s)

Use this forcing in the NCAR SCM.

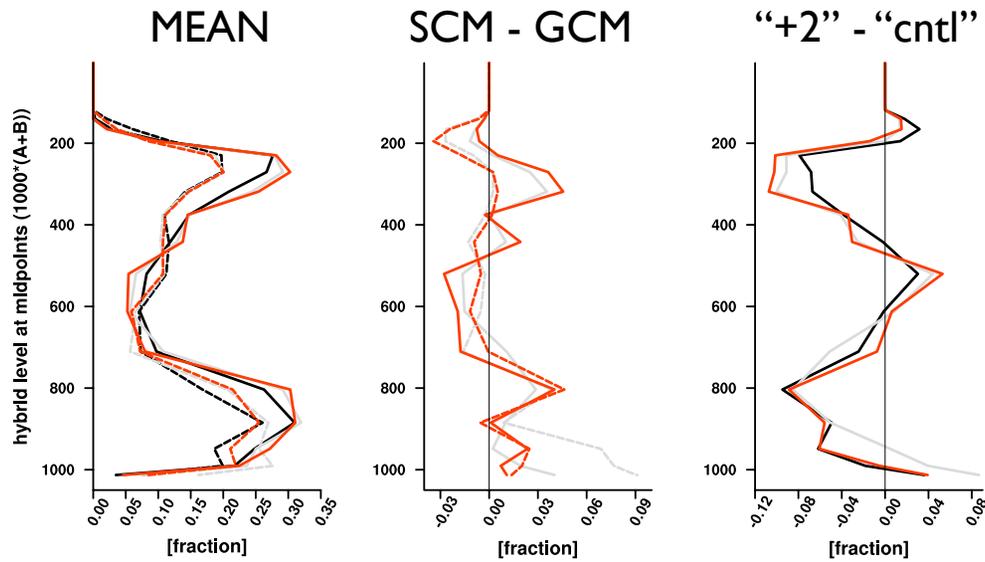
- ▶ Short (30 day) runs, control v. SST+2

Preliminary Results I: 30 days at 30N

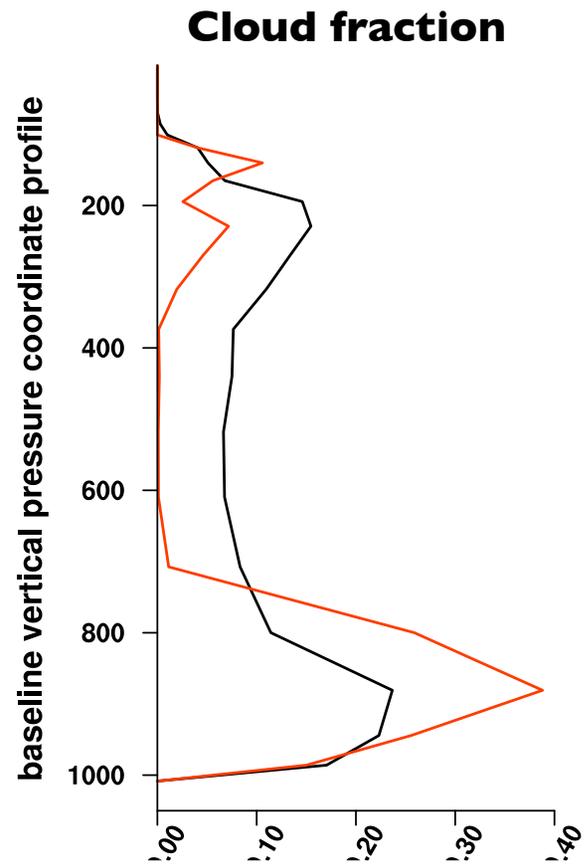
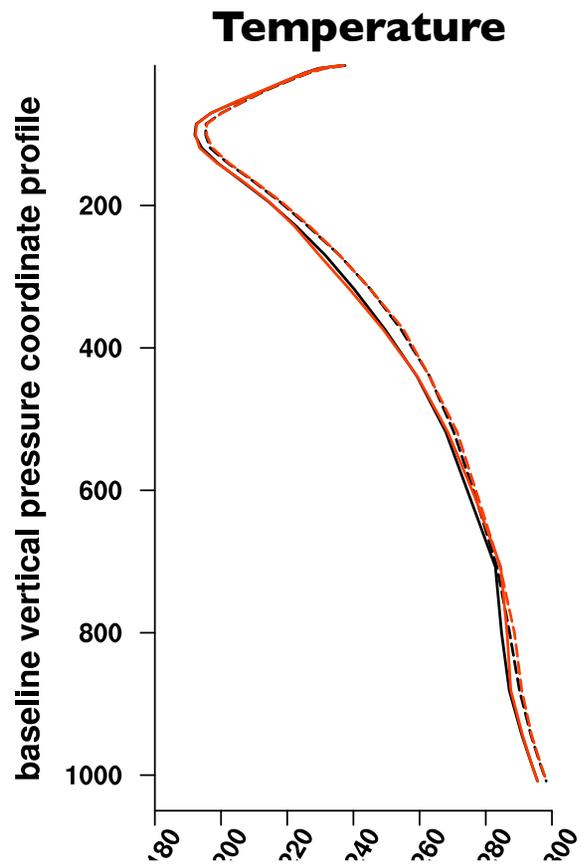


Preliminary Results I: 30 days at 30N

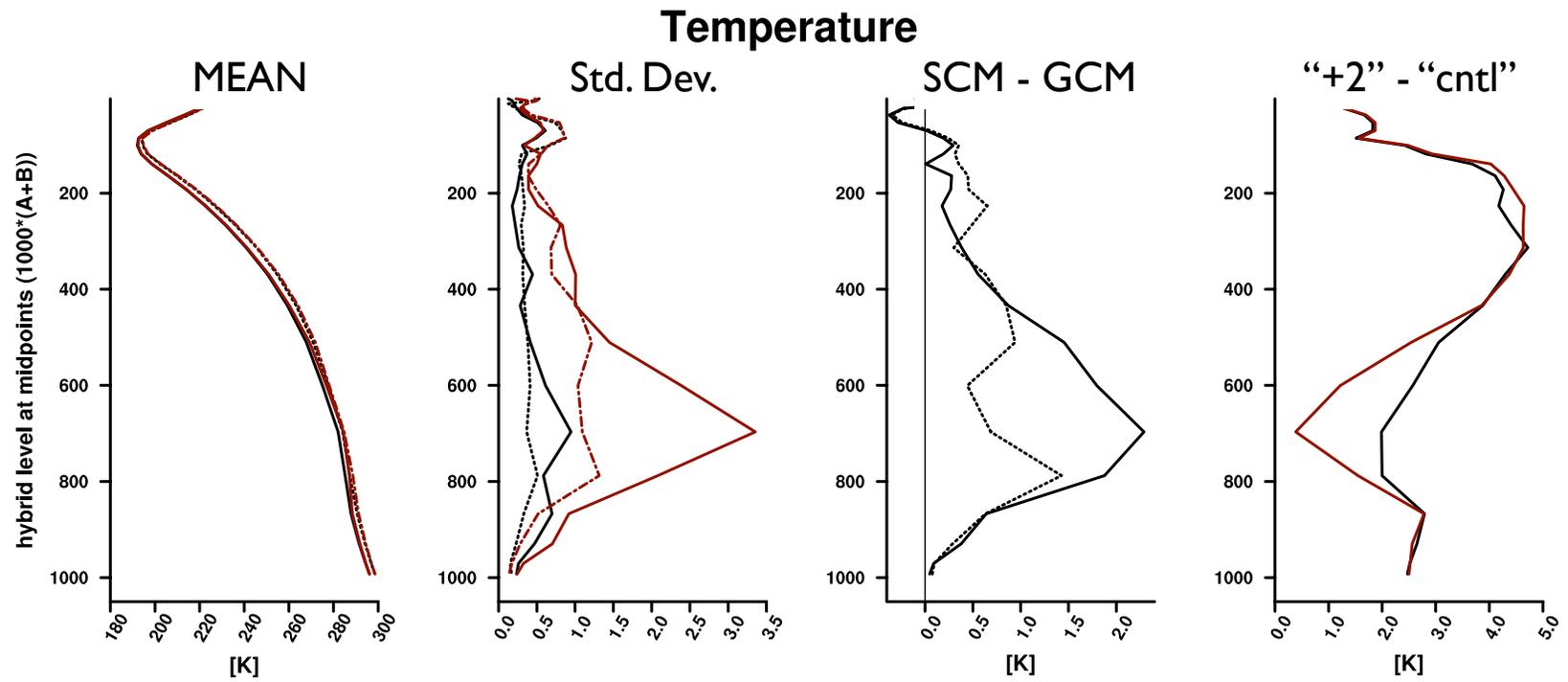
Cloud Fraction



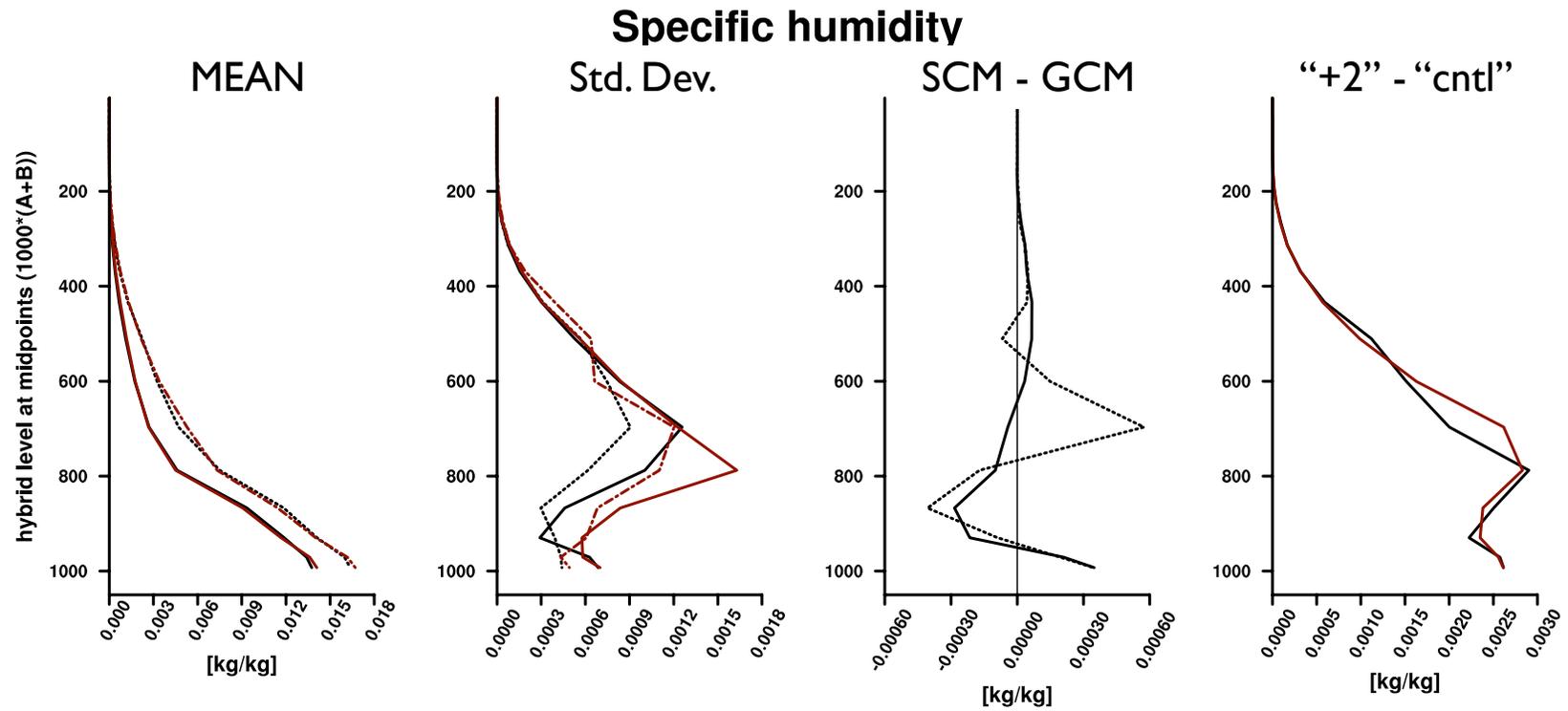
Results II: 30 days at 15N



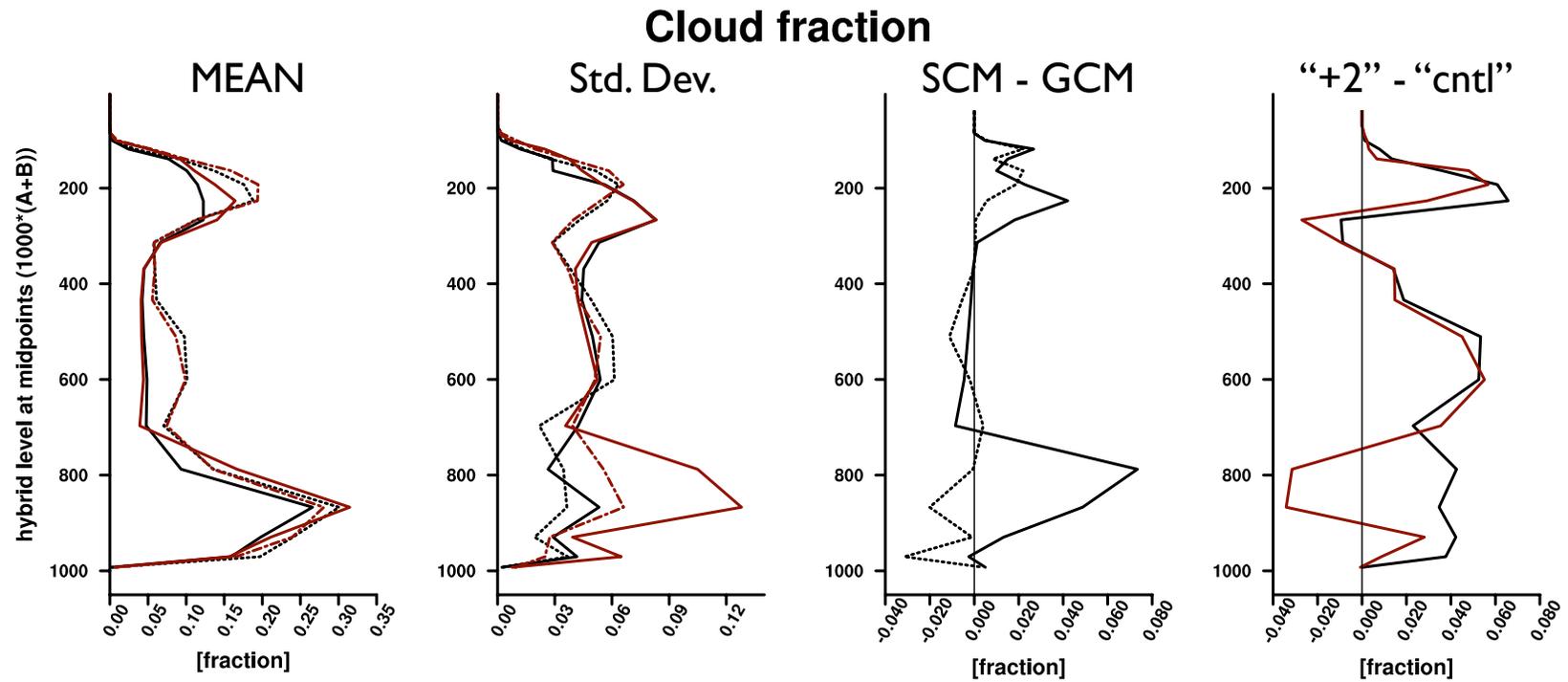
Results III: 30 days at 15N, using 16 longitudes



Results III: 30 days at 15N, using 16 longitudes



Results III: 30 days at 15N, using 16 longitudes



What's next?

Can the SCM capture the nature of the GCM response?

- ▶ What do we have to do to get such agreement?
- ▶ Sensitivity to resolution, specific parameterizations, etc.

Start standardizing forcing dataset for more models