Low Cloud Feedback WG Summary

Chris Bretherton

University of Washington

Low clouds talks

- MMFhr (Marchand/Bretherton). Pilot dx=250m/dz=100m simulations complete.

- IPHOC-MMF (Cheng): Large increases in low cloud compared to regular MMF.

- Sc-Cu transition (Teixeira): A discrete cloudiness-jump model of transition based on LHF/radflxdiv ratio matches aspects of the transition

- LES of RICO (Matheou): UCLA-LES has much more low cloud with a nondiffusive centered advection scheme than with the default monotone scheme.

- CGILS (Bretherton): Different LES produce strikingly different equilibrium simulations of a Sc-topped BL, and different cloud responses to an idealized climate perturbation. Advection/SGS schemes a likely culprit.

Next steps

- Implement a less diffusive advection scheme in MMF-compatible version of SAM (Yamaguchi?)

- Run as long a dx=250 m L52 MMF simulation (month+) as we can afford for full diagnostic assessment (Marchand/Blossey) .

- Diagnose IPHOC in MMF using more standard diagnostics; use IPHOC-diagnosed subgrid cloud fraction in SAM radiation for MMF runs. Retune if possible to achieve MMF TOA energy balance (Cheng)

- Continue to participate in CGILS (Blossey/Cheng/Khairoutdinov/Bretherton)

- Provide MMF output to PCMDI for selected CMIP/CFMIP cases (CSU/NCAR).