



CMMAP Physical Processes Theme

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Strategy

- **Better understand interactions of deep and shallow clouds, and turbulence, microphysics, and radiation.**
- **Better understand representation of interactions of deep and shallow clouds, and turbulence, microphysics, and radiation in prototype MMF.**
- **Test improved physics in MMF.**

Action items from last meeting:

- 1. Implement a new radiation algorithm in SAM. (Pincus)***
- 2. Implement the EDMF scheme in SAM? (Teixeira)***
- 3. Perform more testing of IPHOC in VVM (Cheng)***
- 4. Upgrade/test two-moment cloud scheme in SAM (Morrison)***
- 5. Continue to find/develop improved SGS schemes***
(The rest of us...)

Issues from last meeting

- ✓ Data support at SDSC (account; format conversion)
- ✓ More people to analyze the 1st giga-LES
- ✓ More computer time for more giga-LES runs: *case with stronger PBL interaction; deep convection over land...*
- ✓ Giga-LES with different microphysics schemes; how sensitive and what?
- ✓ How to evaluate these idealized cases?

Short talks

1. Andrew Heymsfield: improving microphysics
2. Wojciech Grabowski: hybrid bulk-bin model
3. Ned Patton: orographic drag with vegetation
4. Anning Cheng: turbulence scheme in VVM
5. Zach Eitzen: deep convective cloud objects
6. Steve Krueger: turbulence closure & scaling of convective precipitation in MMF and SAM...
7. (Chin-Hoh Moeng: the PBL in giga-LES)

Short-term Plans

- **Better understand interactions of deep and shallow clouds, and turbulence, microphysics, and radiation.**
 - *Continue to develop and test parameterizations for coarse-grid CRMs in stand-alone SAM.*

Short-term Plans

- **Better understand representation of interactions of deep and shallow clouds, and turbulence, microphysics, and radiation in prototype MMF.**
 - *Identify physical processes responsible for MMF deficiencies.*

ACTION ITEM: Analyze existing MMF simulations.

ACTION ITEM: Perform new MMF simulations that involve changes to MMF physics. *(Computer time is required.)*

(1) Replace boundary layer turbulence scheme used in CRM:

Anning Cheng, Cara-Lyn Lappen, Marat Khairoutdinov.

(2) Use higher spatial resolution:

A Low Cloud Feedbacks activity.

Long-term Plans

- **Test improved physics in MMF.**

Issues

- **Computer time will be required for the proposed simulations.**
 - Large request due next week. Will participate in this request.
- **Large size of large-domain LES output dataset will make it a challenge to access and analyze.**
 - This is actively being addressed: Cyber Infrastructure, John Helly.
- **Help with modifying SP-CAM code to test new parameterizations:**
 - Marat will make stand-alone SAM interchangeable with SAM used in MMF.