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.