A CPT for Cloud Parameterization and Aerosol Indirect Effects

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Cloud “macrophysics” and its application to aerosol indirect effects

• Goal: Improve (low) clouds in GCMs.
• Focus on the effects of aerosols on clouds
  – Can we activate aerosols correctly,
  – Covariability of microphysics and dynamics
• Test GCMs versus LES, aircraft observations, and satellite observations
CAM Development Efforts

• Implement a new cloud macro-physical parameterization based on multivariate PDFs in CAM (and GFDL’s AM).
  – Cloud Layers Unified By Bi-normals (CLUBB: Larson & Golaz)
  – Joint PDFs for vertical velocity, liquid potential temperature, and total water mixing ratio

• Generalize in CAM to work as a sub-column layer
  – Integrate with other CAM efforts: Sub-Columns, Statistical Cloud Schemes
  – SP-CAM

• Evaluate against Observations (e.g. VOCALS) & LES
Team Members

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- GFDL (GCM simulations): L. Donner, J.-C. Golaz, Y. Ming
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