

Physical Processes Breakout Summary

830-845 am: Steve Krueger "The transition from shallow to deep convection in the Giga-LES"

845-900 am: Kuan-man Xu "Improved low cloud simulation with an upgraded MMF"

900-915 am: Andrew Heymsfield "Ice particle size distributions and fallspeeds in clouds at temperatures from 0 to -87 C"

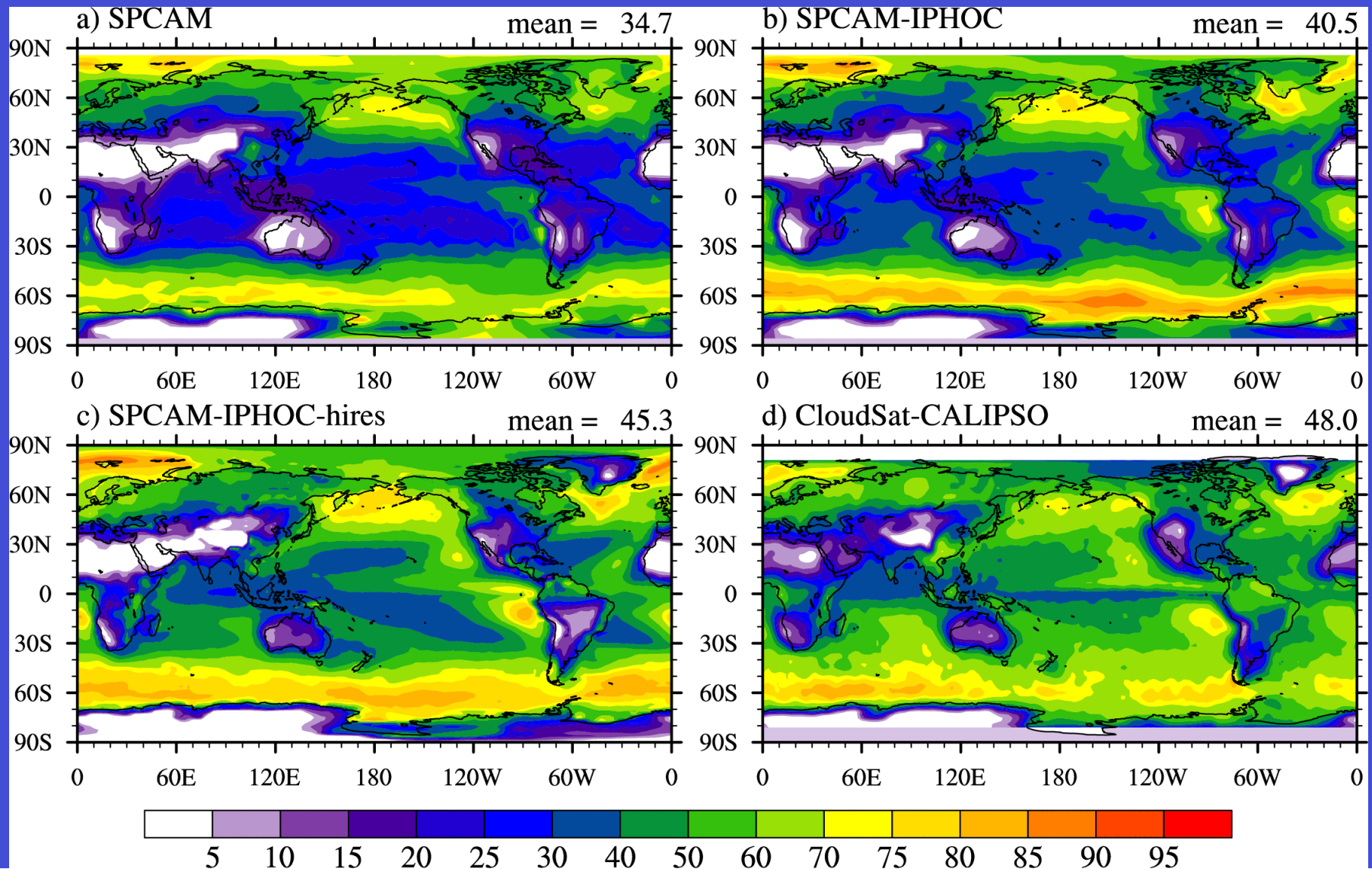
915-930 am: Wojciech Grabowski "Modeling of subgrid-scale cloud-clear air turbulent mixing in Large Eddy Simulation of cloud fields"

930-945 am: Hugh Morrison "Sensitivity of a mid-latitude squall line to parameterization of raindrop breakup"

945-1030 am: Discussion and plans

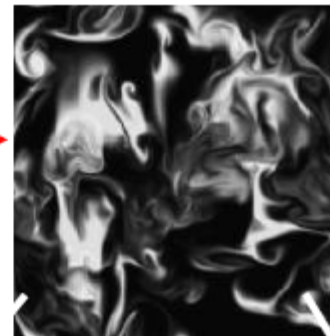
Kuan-man Xu: "Improved low cloud simulation with an upgraded MMF"

Low-level (sfc - 700 hPa) cloud amount (%)



Wojciech Grabowski: "Modeling of subgrid-scale cloud-clear air turbulent mixing in Large Eddy Simulation of cloud fields"

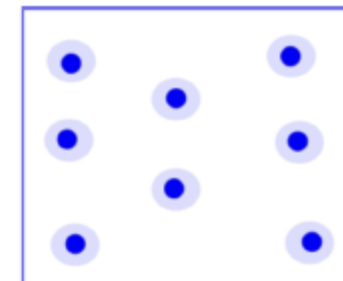
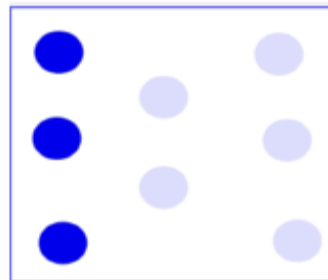
Turbulent cloud-environment mixing: impact on cloud microphysics



extremely
inhomogeneous
mixing

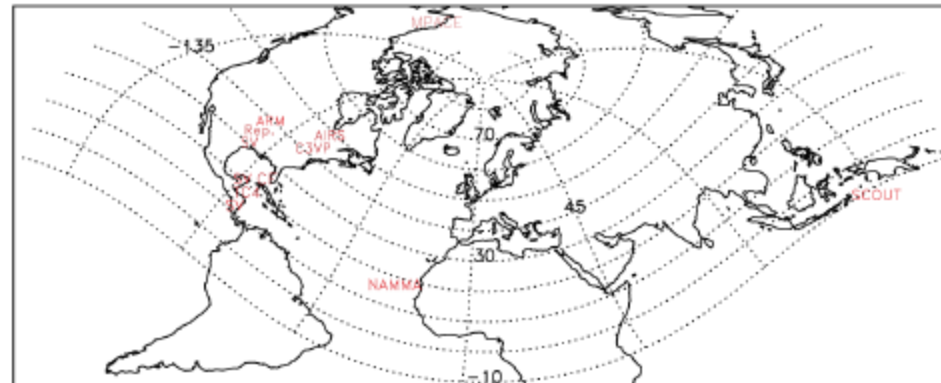
homogeneous
mixing

Microphysical
transformations due to
subgrid-scale mixing may
cover a wide range of
mixing scenarios.



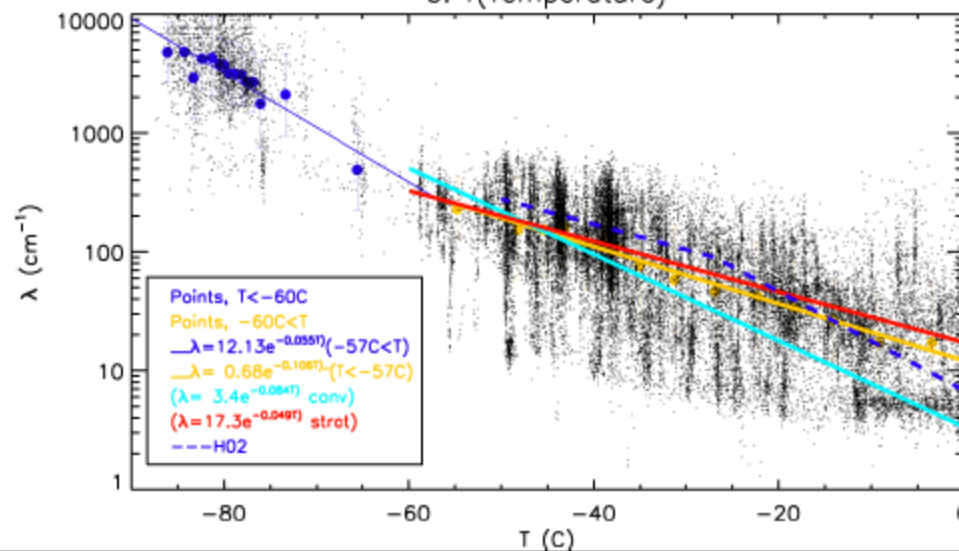
Andrew Heymsfield: "Ice particle size distributions and fallspeeds in clouds at temperatures from 0 to -87 C"

FIELD CAMPAIGNS

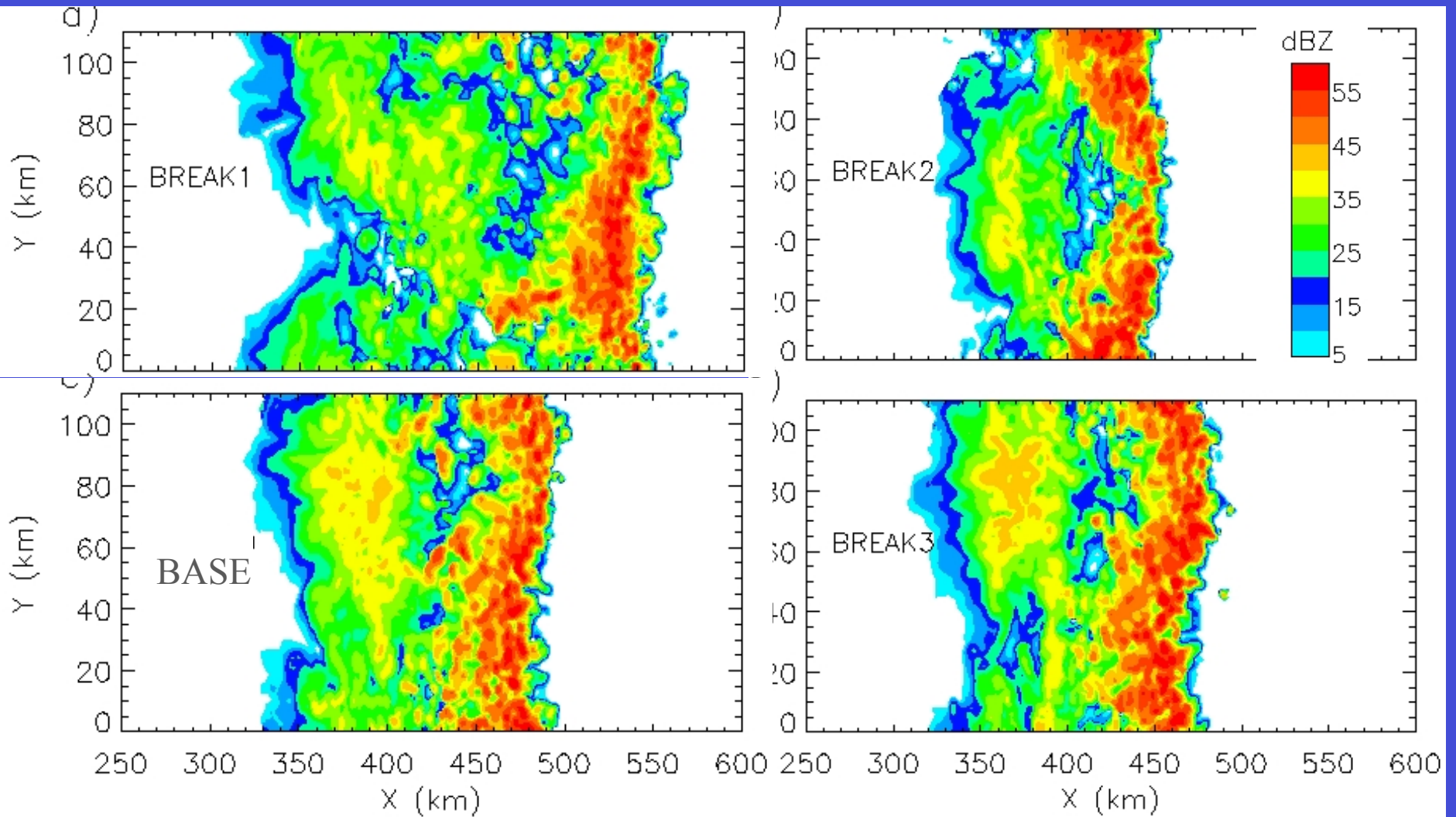


ARM: ARM 2000, Atmospheric Radiation Measurement (ARM) Field Campaign, 2000
 CF: CRYSTAL-FACE, The Cirrus Regional Study of Tropical Anvils and Cirrus Layers - Florida Area Cirrus Experiment, 2002
 TC4: The Tropical Composition, Cloud and Climate Coupling (TC4) Field Campaign, 2007
 NAM: NAMMA - The NASA African Monsoon Multidisciplinary Analyses Campaign, 2006
 AIRS: AIRS_2, Alliance Icing Research Study II, 2003-2004
 C3VP: Canadian CloudSat/CALIPSO Validation Program, 2006-2007
 Rep: Replicator Observations, First ISCCP Research Experiment (FIRE)-2, 1991
 SV: Experiments with CF and pre-AURA Validation Experiment, 2002 and 2004
 SCOUT: Stratospheric Climate Links w/Emphasis on the Upper Troposphere/Lower Stratosphere, 2003
 MPACE: Mixed-Phase Arctic Cloud Experiment, 2004

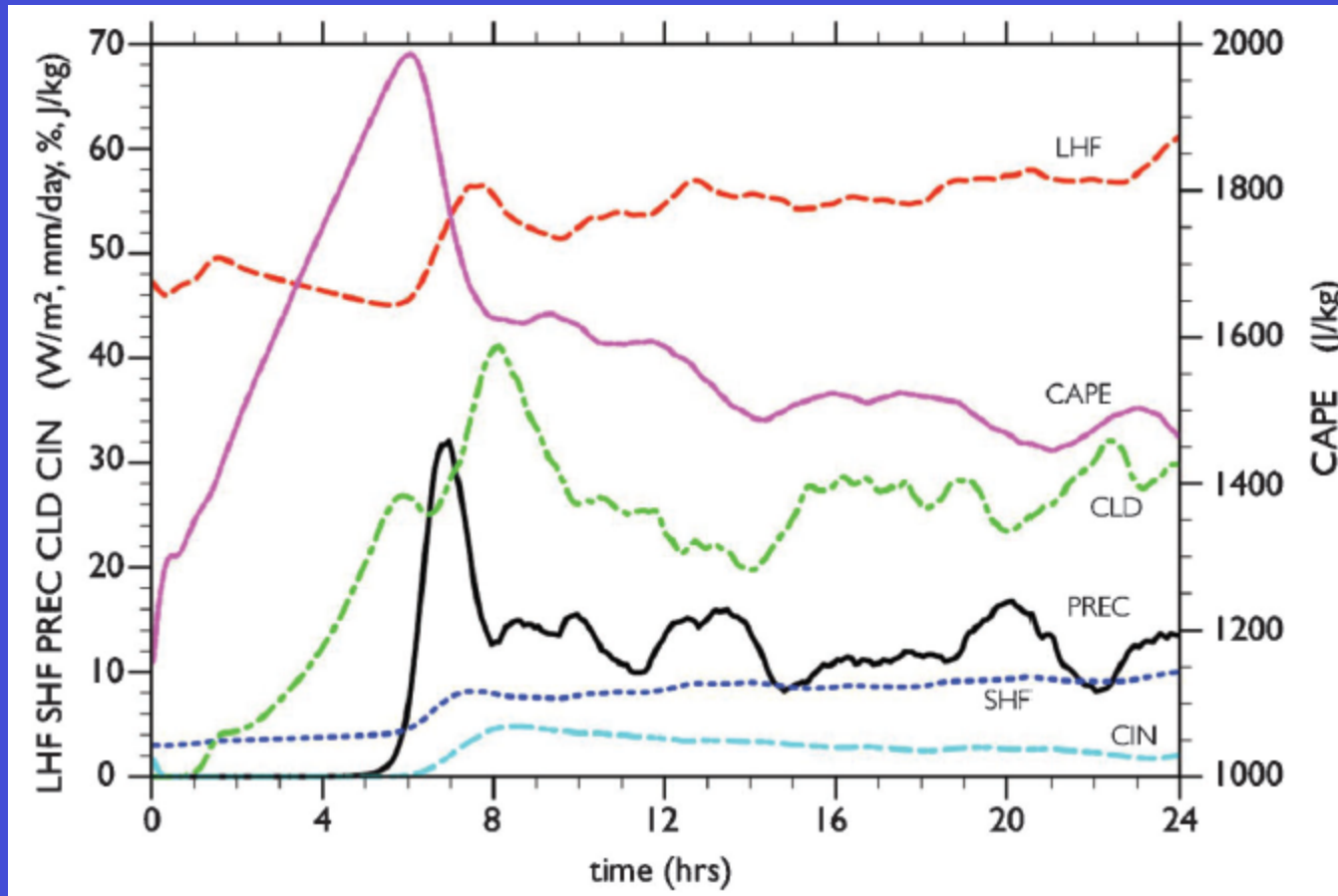
b: f(Temperature)



Hugh Morrison: "Sensitivity of a mid-latitude squall line to parameterization of raindrop breakup"



Steve Krueger: "The transition from shallow to deep convection in the Giga-LES"



Discussion Issues

- more systematic efforts for physics testing? e.g., do we want to focus efforts in a common modeling framework → PNNL MMF vs. SpCAM3.5 vs....
- common framework for testing of various turbulence parameterizations (start with testing of GCSS cases in SAM) – form group to look into this (S. Krueger)
- leverage development of CMMAP testing portal (Jack Ritchie and John Helly)
- merging of new physics parameterizations (microphysics + turbulence)
- physics testing in coupled climate runs
- physics in the GCRM