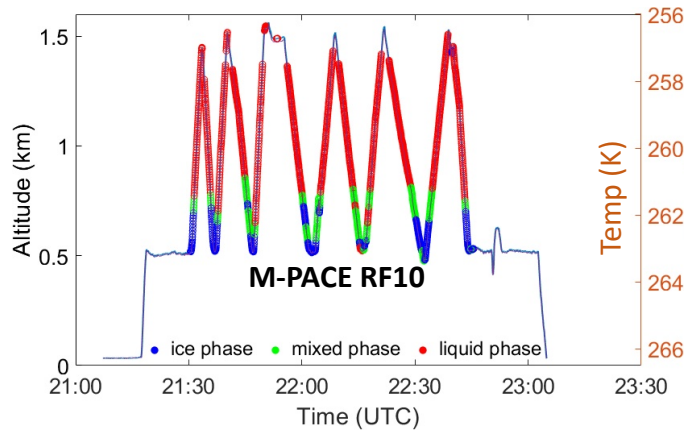


Minghui Diao¹, Neel Desai¹, Ching An Yang¹, Meng Zhang^{2,3}, Xiaohong Liu², Shaocheng Xie³, Damao Zhang⁴, Andrew Gettelman⁵, Kai Zhang⁴, Jian Sun⁴, Wei Wu⁶ and Greg McFarquhar⁶

¹San Jose State University, ²Texas A&M University, ³Lawrence Livermore National Laboratory, ⁴Pacific Northwest National Laboratory, ⁵National Center for Atmospheric Research, ⁶University of Oklahoma

Objectives

1. Examine mixed phase cloud (MPC) characteristics in high latitudes in the Northern and Southern Hemispheres
2. Evaluate MPC in DOE Energy Exascale Earth System Model (E3SM) model



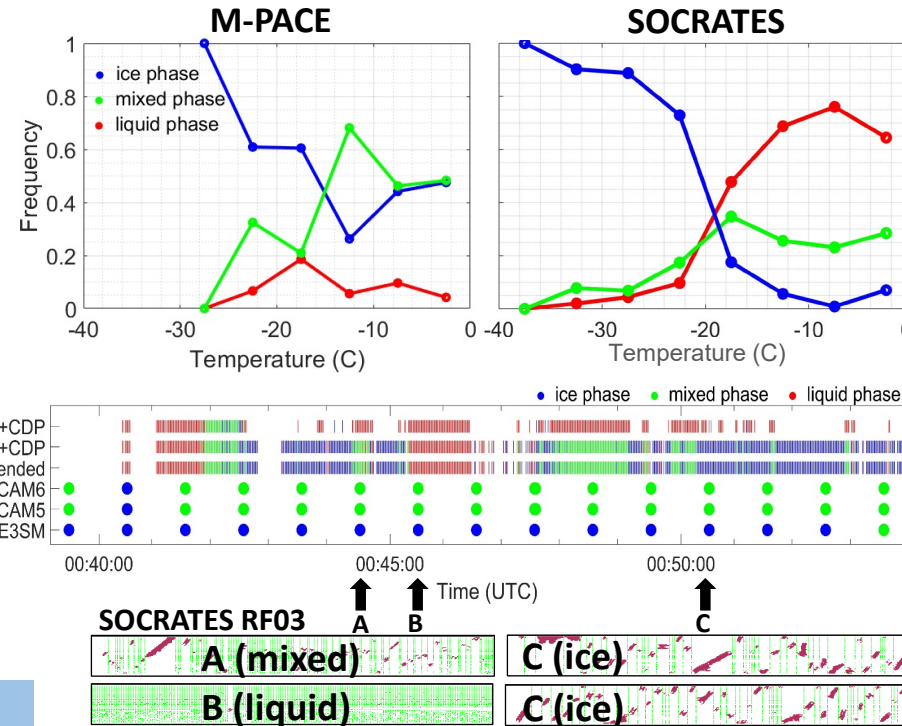
Aircraft Measurements

1. DOE M-PACE 2004 (Alaska, 70 – 72 °N)
2. NSF SOCRATES 2018 (Tasmania, 40 – 65 °S)

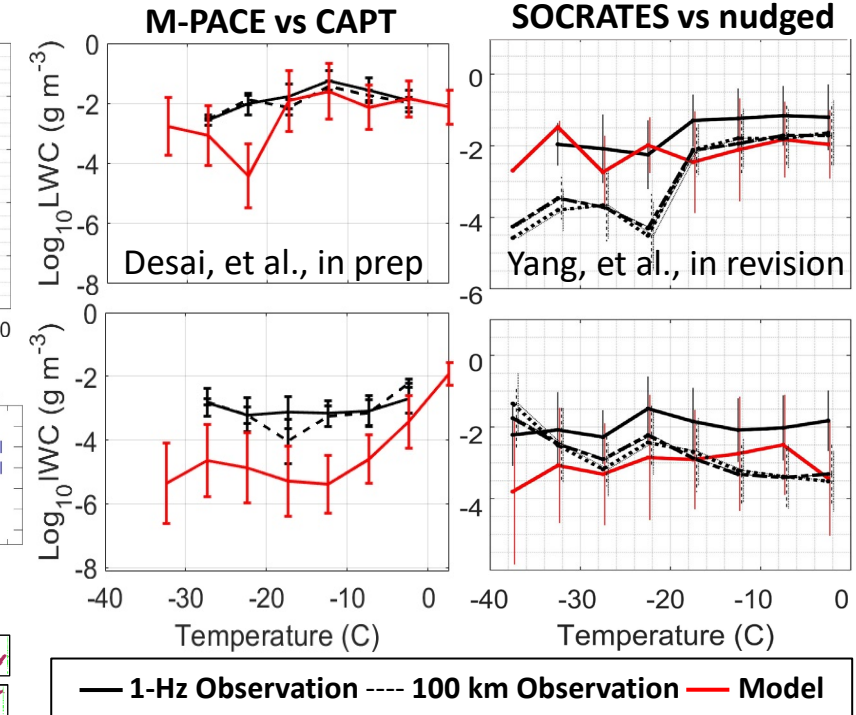
Model Simulations

1. E3SM in CAPT (Cloud-Associated Parameterizations Testbed) mode
2. E3SM in nudged mode

Observations



Comparison with E3SM



Key Findings and Planned Work

1. Observations show vertical stratifications of cloud phase in many cases
2. E3SM shows improvement of allowing more supercooled liquid water than NCAR CAM5
3. E3SM consistently underestimates IWC, but LWC is well represented at -20 to 0°C.
4. Planned work: Secondary ice production (SIP) and ice nucleating particles (INP) in high latitudes

Minghui Diao – Thursday June 24 Poster 2-3 pm ET (minghui.diao@sjsu.edu)

Mixed phase cloud processes and Aerosol Indirect Effect over Southern Ocean and Antarctica