

CAPI Ice Nucleation Breakout Summary

This session focused on the discussion of top priorities related to ice nucleation studies and the short-term (0-2 years) and long-term (2-5 years) action plan to accomplish these tasks. We started the session with several presentations which highlight the PI activities of this group covering in situ and remote sensing observations and modeling studies.

- Paul DeMott: Field and laboratory Explorations of Marine Ice Nuclei
- Gourihar Kulkarni: Ice nucleating properties of bare, coated, oxidized, coagulated, and thermally treated diesel soot particles
- Daniel Knopf: What individually identified ice nuclei tell us about the atmospheric glaciation process
- Damao Zhang: Seasonal variations of ice number concentration in stratiform mixed-phase clouds over ACRF NSA site
- David Mitchell: Globally mapping regions of homo- and heterogeneous nucleation as a function of latitude and season: A potential strategy using CALIPSO
- Xiaohong Liu: Effect of aerosols on the phase partitioning of mixed-phase clouds through comparison of Community Atmospheric Model (CAM5) and CloudSat/CALIPSO observations

After these presentations, we discussed and agreed the *Top priorities* for our group:

- Long-term ice nuclei (IN) measurements at ARM super-sites.
- Identify the IN measurement technique (e.g., CFDC, filter sample) and that can be automatic.
- IOP for IN closure to understand IN sources and sinks

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Short-Term Action Plan (0 to 2 years)

- ✓ Deploy IN instrument at ARM super-sites (e.g., SGP and/or NSA), and start collecting IN data.
- ✓ Investigate filter/substrate based technique for IN measurement.
- ✓ Participate in the international IN instrument intercomparison workshop in Fall of 2014 and Spring and Fall of 2015.
- ✓ Classify the IN concentration as a function of aerosol size, mixing state, composition to better understand the ice nucleation processes.
- ✓ Participate in other group activities (e.g., CLWG cloud phase partitioning) to understand importance of other ice microphysical processes on cold clouds (e.g., ice growth, ice sedimentation, Bergeron-Findeison process, etc.).

Long-Term Action Plan (2 to 5 years)

- ✓ IOP at Barrow for IN closure studies.
- ✓ Rain/snow water collection and analysis of the residues.
- ✓ Participate in the proposed multi-agency Southern ocean field experiment (SOCRATES) to understand the importance of biological particles towards ice formation.
- ✓ Use IN measurements to explore remote sensing retrievals and to constrain the models.