

Can We Improve the Working Relationship Between the ARM CPWG and the Modeling Community (CMWG and GCSS)?

Personal Observation: Much of the internal discussion regarding retrieval algorithm development is often based on only a vague notion of “what the modelers want”

Entire research projects are built around these vague notions and then we wonder why the modelers don't pay attention when we give them what we thought they wanted.

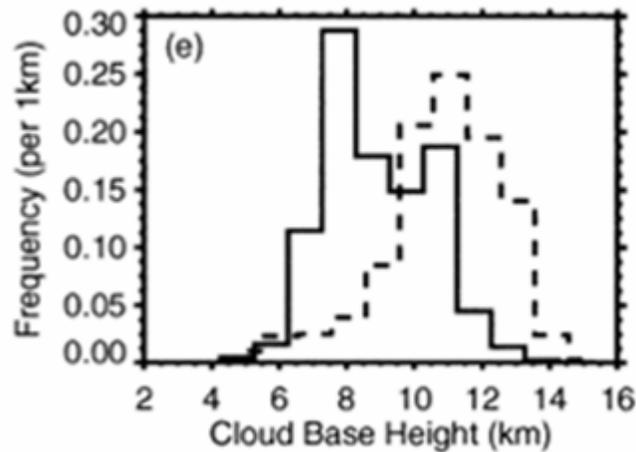
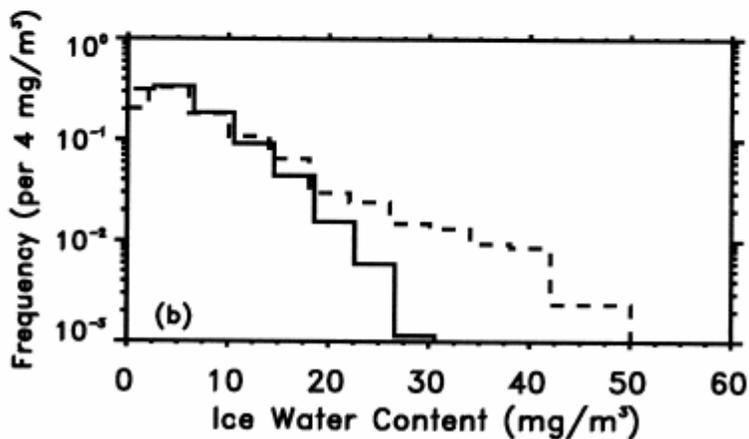
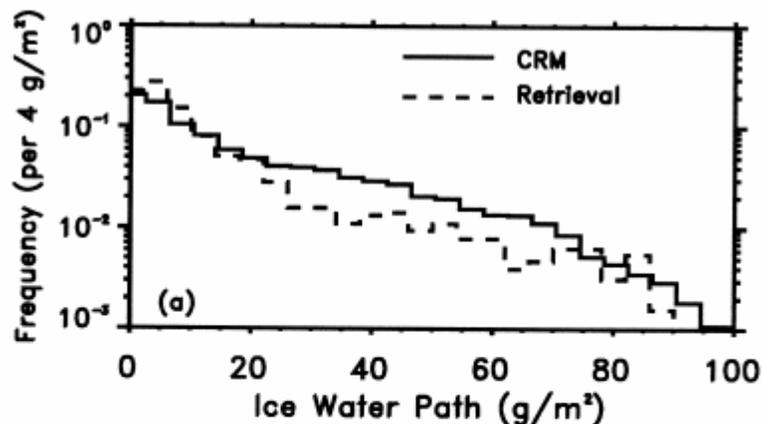
Proposal: A more efficient approach might be to develop partnerships between the groups and between individuals within the groups.

Advantages of an ongoing dialogue:

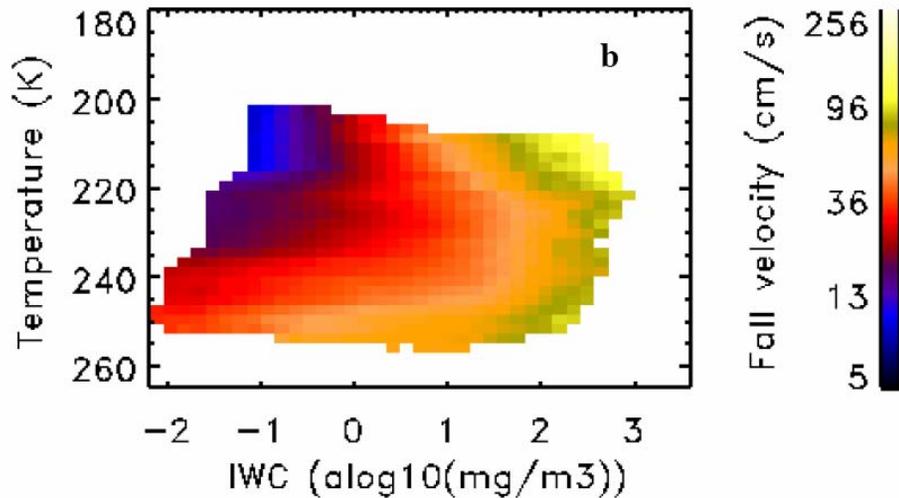
- 1) Modelers know what they want
- 2) Observationalists can determine what is possible

An example: Comparing CRM-derived cirrus properties with ARM retrievals...

From Luo et al., 2003



Our Response – a mass-weighted sedimentation parameterization



So, I posed a question to the GEWEX GCSS group chairs:

What are the 3 biggest modeling problems in your respective groups and how do you see ARM contributing to these problems?

(Pier Siebesma, Steve Dobbie, Jon Petch, James Pinto, Steve Klein)

General Responses:

- ARM is doing a pretty good job responding to the needs of the modeling community.
- The most basic items are typically described as the most necessary: T and q profile time series, time series of integrated quantities (LWP, IWP, etc), Large-scale forcing, ...
- More Challenging: Joint PDF's of microphysics with cloud-scale dynamics and thermodynamics

Specific Responses:

Pier Siebesma (Chair of GCSS and Boundary Layer Clouds WG)

- **Measurements and retrievals that constrain the unobservable physics.**
- Cloud Feedback Model Intecomparison Project (CFMIP) will encourage modeling groups to extract grid points for select locations from their model runs so that statistics can be compared – similar to CAPT project but in a simulation mode.

Jon Petch (Precipitating Cloud Systems Group Chair)

- Suggested an ARM observational scientist be responsible for interacting with each working group to foster interaction and keep it going.

Specific Responses:

Steven Dobbie (Chair of Cirrus WG)

- Microphysical quantities important to formation and growth of ice crystals
 - Nucleation Rates,
 - Habit,
 - Ventillation and deposition coefficients
- Coupling between microphysics, cloud-scale dynamics, radiation, turbulence
- More Aircraft data

James Pinto (Chair of Polar Clouds WG)

- Coupling between microphysics, cloud-scale dynamics, radiation, surface turbulent fluxes
- Ice PSD, CCN and IN,
- **Better Error Characterization of observations**

Our goal will be to foster a more collaborative relationship between CPWG algorithm developers and the modeling community.

Summary:

Continue providing basic quantities for case studies but focus on

1. collaborations that result in observational constraints on the unobservable physics of the modeling problem.
2. Better characterization of error
3. More emphasis on the interaction between microphysics and cloud scale dynamics.