



Developing particle standards having known size, shape and composition to improve measurement and model performance

Purpose of 2018 PI meeting breakout:

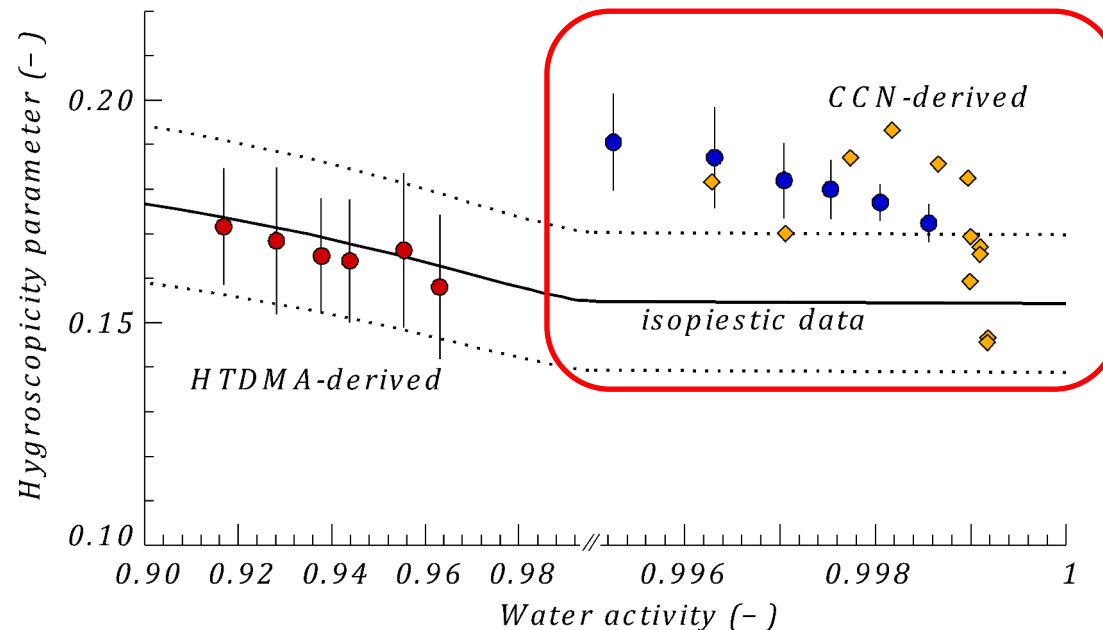
- Bring together theorists, modelers and experimentalists in order to **articulate needs for new types of aerosol standards** that will both aid in interpreting lab and field **measurements** as well as assure that those measurements address the needs of **models**.
- The discussion addressed **methods that could be employed in the near term** with established technologies as well as **new types of standards that need to be developed**.

Chapters (drafts completed)

- I. Aerosol Size Distributions and Number Concentrations (Kuang)
- II. Species-Resolved Mass Concentration Standards for Aerosols (>50 nm) (Canagaratna, Croteau, Gaston, and Jimenez)
- III. Species-Resolved Mass Concentration Standards for Aerosols (<50 nm) (Smith and Johnston)
- IV. Soot Particles (Sedlacek and Onasch)
- V. Particle Hygroscopicity: Water Uptake and CCN Measurements (Petters)
- VI. Aerosol standards for ice nucleating particle measurement methods (DeMott)

From Chapter V: Particle Hygroscopicity: Water Uptake and CCN Measurements (Petters)

Measured hygroscopicity parameter (κ) of lab-generated sucrose particles



For CCN studies two different standards disagree, pointing to a bias (both instruments were calibrated with $(\text{NH}_4)_2\text{SO}_4$)

- The bias from laboratory studies in controlled environments with nominally well-behaved systems is on the order of 20%. Experimental uncertainties in field experiments are likely larger.
- It will likely require significant effort to further reduce the uncertainty.

Vision for White Paper

- White paper will be a “living document” that can evolve over time as technologies improve.
- It will likely be published as a Google Doc, with editing access for the authors, and commenting access for everyone else.
- Google Docs keep a revision history, so we can look at past versions and see the changes that have been made, and when and by whom, if that's relevant.

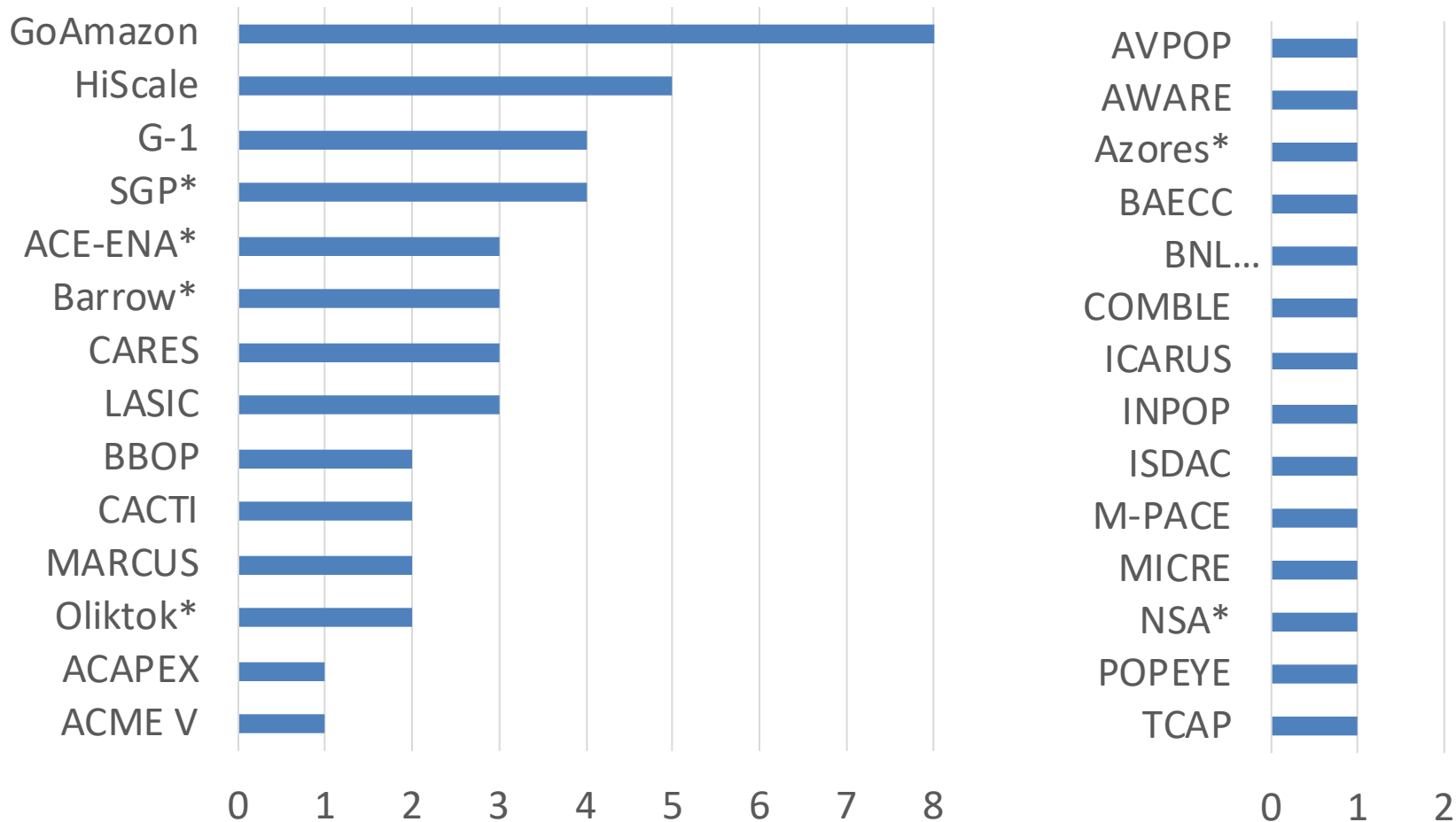
Aerosol Processes Working Group Survey on ARM Aerosol Data Products

- In January 2019, we asked the Aerosol Processes working group the following questions:
 1. Which ARM aerosol data products are you using in your research?
 2. If you are not using ARM data products in your research, why not?
 3. Are there data products that you wish ARM could provide, but currently does not?
- Purpose of this survey:
 - Obtain community input to better align ARM observations with community research needs.
- 34 responses from working group members. (Thanks, everyone!)
- If you want to respond right now: nriemer@illinois.edu

1. Which ARM data products are you using in your research?

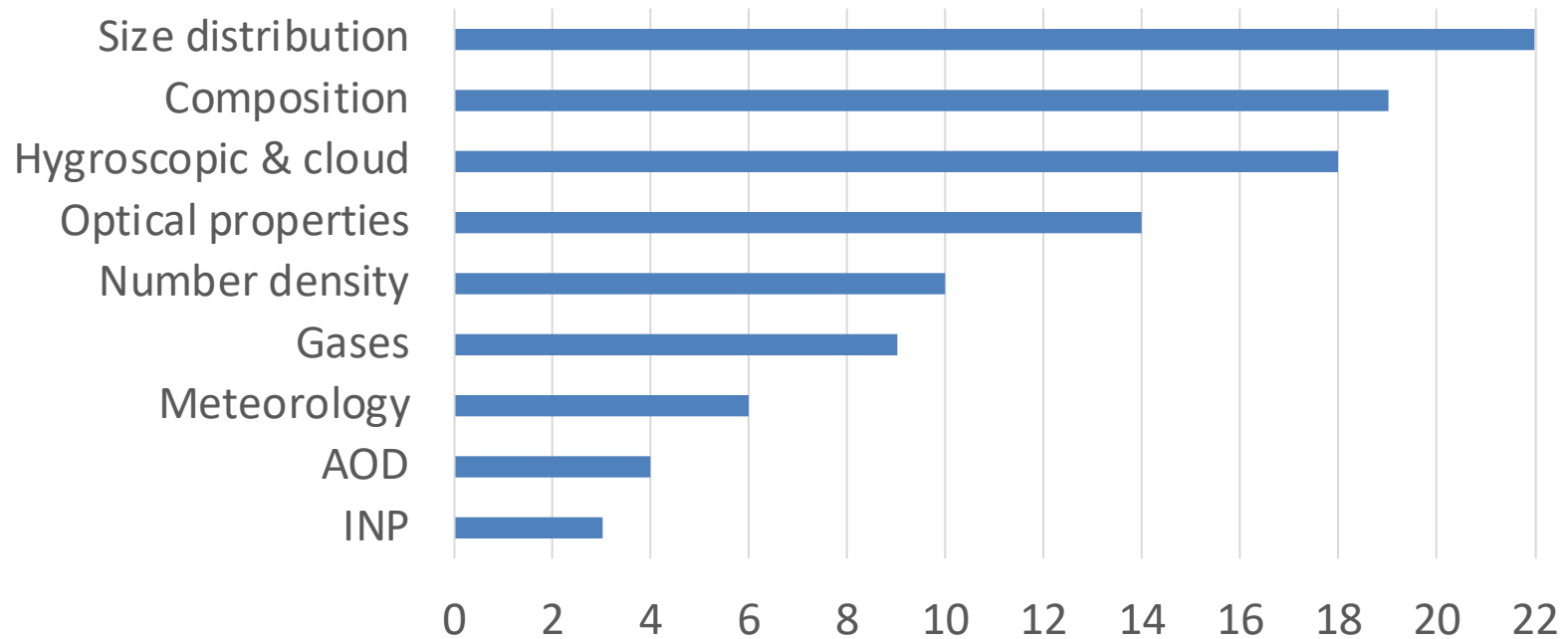
- Many responses mentioned the use of campaign data: 43 times
- Long-term sites were mentioned less frequently: 14 times
- Focus on:
 - Size distributions
 - Composition (ACSM)
 - Hygroscopicity/CCN concentrations

Campaigns and sites – number of mentions



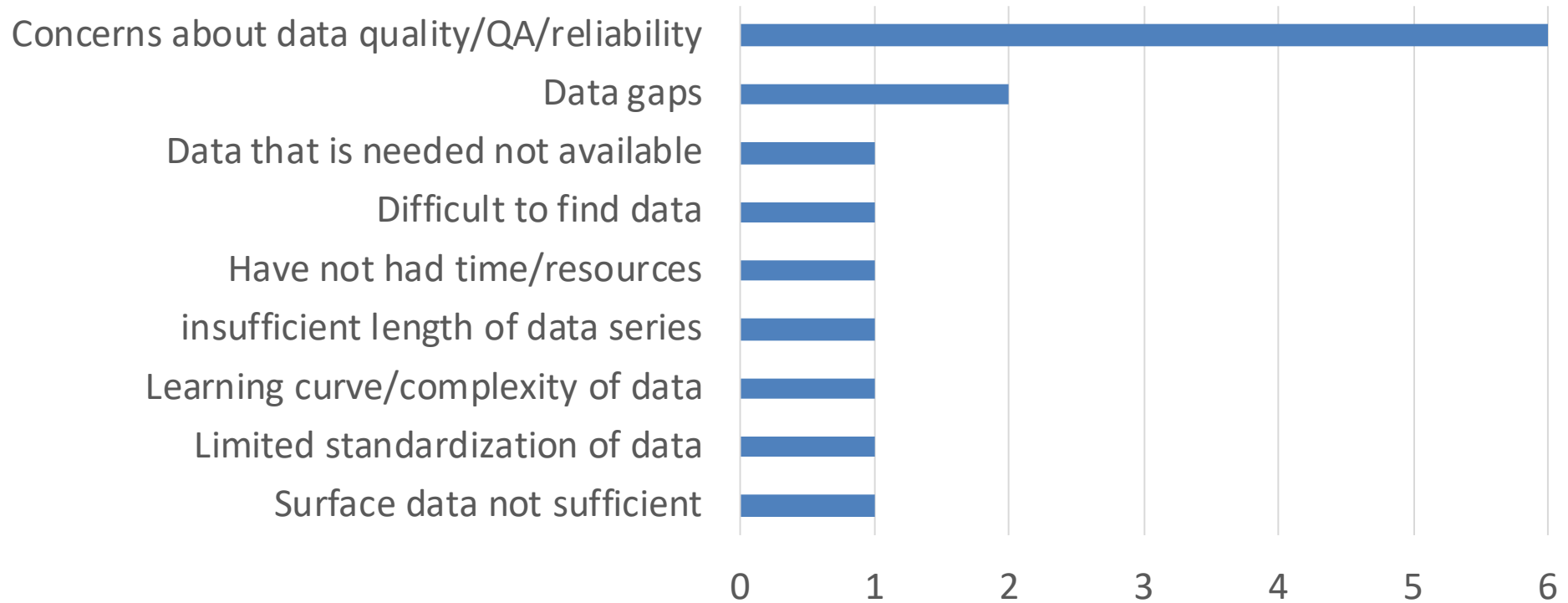
* Long-term sites

Measurement areas – number of mentions



Measurement areas from Table 1 in McComiskey & Sisterson, *ARM Aerosol Measurement Science Group Strategic Planning Workshop 2017* (plus AOD and INP)

2. If you are not using ARM data products in your research, why not?



3. Are there data products that you wish ARM could provide, but currently does not?

