

## ***Interactive comment on “Aerosols, Clouds, and Precipitation in the North-Atlantic Trades Observed During the Barbados Aerosol Cloud Experiment. Part I: Distributions and Variability” by E. Jung et al.***

**Anonymous Referee #2**

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Review of: Aerosols, Clouds, and Precipitation in the North-Atlantic Trades Observed During the Barbados Aerosol Cloud Experiment. Part I: Distributions and Variability By Jung, Albrecht, Feingold, Jonsson, Chuang and Donaher.

Evaluation: Publish with minor revisions

Major comments:

This very much reads as a paper setting the stage for something to come. As such it is a bit light, but it does contain sufficient information to warrant publication.

C1

Minor comments:

Page 5 line 11: “The PCASP dries the particles before measuring them.” Please provide a reference for this. For instance, Strapp et al (1992, JAOTech) leaves the door open for the PCASP only partially drying particles larger than sub-micrometer (their summary). Thus the behavior may be quite different for a dust particle (or for a coated dust particle) and a sea-salt particle. Other references?

Page 5 line 15: Missing integration sign in denominator.

Page 9 lines 24-26: I am not sure what you are implying here; does sea-salt not contribute to the larger sizes in Fig. 6? This would seem to be inconsistent with many studies that have found sea-salt in the entire range of marine aerosols, e.g. Clarke et al. (2006, JGR), Blot et al (2013, JGR), Modini et al (2015, JGR).

Page 10, lines 8-9: A reference for the sizing uncertainty?

Page 31 and rest of manuscript: Are you connecting a PCASP (which you claims dries particles), with a CIP which does not materially dry dust particles (except maybe for a thin coating layer) and which when measuring sea-salt will see un-dried hydrated particles. I do not see any discussion of the fact that you do not necessarily know what is being looked at with the CIP; maybe I missed it?

Page 11 line 9: What is a “CIP volume number concentration”? It occurs several times.

Page 11 line 20: “increases with height.” This is one of the places that the manuscript comes up missing some context. No discussion of why such a pattern may be observed, nor of what has been observed of this in the past (e.g. Lasher-Trapp work)?

Page 13 line 18-19: “tendency for aerosols to suppress precipitation.” Do you mean increase in aerosols?

Page 14 lines 12-14: Could it be that not all clouds reach the same altitude, and that the shallower ones thus bias the statistics at low altitude?

C2

