

## ***Interactive comment on “Precipitation regimes over central Greenland inferred from 5 years of ICECAPS observations” by Claire Pettersen et al.***

**Anonymous Referee #2**

Received and published: 2 February 2018

This is a well-written, innovate paper. I have only minor questions:

At page 3 line 14 you describe the IC clouds as Ns. I am highly doubtful that the ice precipitation in Ns forms through entirely ice-cloud processes as stated. Ns is associated with heavy precip, and I have yet to see Ns ice precip where liquid somewhere in the profile is not the origin of the ‘heavy’ precip. For my education, since I’m not an expert on MWR, what is the effect of a deep layer of ice below a thin liquid layer at the top on the measurements (Fig. 1b)? The description in the paper does not address this scenario. Does this produce your indeterminable snow category? Maybe all you need to do is remove the Ns from page 3.

Page 6 L 10: no aggregation in these clouds? I doubt it, see my comments on Figure 6.

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Page 7 line 14: define BT

Figure 4: Why is panel c only addressed in a parenthetical comment in the caption?

Page 13 Line 14/14: What does ‘per event’ mean in this context? These are aggregate results over 5 years?

Page 15 line 20: Narrow is in the eye of the beholder. Please quantify.

Figure 6: What single ice crystal type has, on average, mean fall speeds 1+ m/s as suggested for both IC and CLW clouds? Remember, in the IC clouds you only have vapor deposition and aggregation as available growth processes. I suggest collection growth is far more important in both clouds types than suggested in this paper.

Figure 8: Please discuss the potential for a sampling bias towards light precip events? I suspect it is difficult to get ‘good’ samples in heavy precip events?

Page 20 line 23: extremely?

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-857>, 2017.

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