

## ***Interactive comment on “Cloud Regimes Over the Amazon Basin: Perspectives From the GoAmazon2014/5 Campaign” by Scott E. Giangrande et al.***

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Review of “Cloud Regimes Over the Amazon Basin: Perspectives From the GoAmazon2014/5 Campaign” by Scott E. Giangrande, Dié Wang, and David B. Mechem Alan K. Betts (akbetts@aol.com)

This data analysis from GOAmazon is valuable. An upfront discussion of the limitations in drawing conclusions from 2 years of data would be useful. The main challenge I had as an outside reviewer is unclear definitions early in the paper. I also suggest a change of style introducing each Figure would improve the readability. L84 LCL is missing from this list L92 Regime breakdowns (clusters) is not defined – see below

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L99 Cluster routines incorporate: use of cluster is unclear L141 Finally you say: (Figure 1; Herein, we use the terms ‘cluster’ and ‘regime’ interchangeably). Looking back I see cluster is used in the abstract with no indication of what it is – derived from a model, described in section 2.2. The term is introduced in L 42-44. I recommend you rewrite L42-44 in the form We classify the primary thermodynamic regimes that are associated with the cloud observations over Manaus, based on a cluster analysis, by applying a k-means clustering technique (refs), to the morning radiosonde launches collected during the GoAmazon2014/5 campaign. This also isolates the potential controls of large-scale conditions on convective regimes. I find the use of ‘breakdown’ (as in L92 and elsewhere) confusing – perhaps because meteorologically it has been used for the breakdown of the dry season. Do you need it when you are simply describing the classification of days into regimes defined by the cluster analysis? Eg L149-51 could be written clearly as (consistent with L130): Figure 1 shows the cluster classification according to calendar-based Amazon definitions for the wet, dry and transitional seasons. The dry season months (Figure 1, bottom left panel) are predominantly associated with regimes 1-3, while the traditional Amazon wet season months (Figure 1, top right panel) are associated with regimes 4 and 5, with negligible contributions from the remaining regimes. Style. Generally I find texts much easier to read if each new Figure is always introduced with: Figure X shows. . . (rather than mentioned at the end of a sentence in parentheses) Figure 2 needs to reference Fig 1 for the cluster colors. Figure 11. How can the black plot for ALL be above all the regime classes at night? Isn't it an average of them?

PDF attached

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2020-67/acp-2020-67-RC2-supplement.pdf>

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