

## ***Interactive comment on “Lidar measurements of thin laminations within Arctic clouds” by Emily M. McCullough et al.***

**Anonymous Referee #2**

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This paper describes a very interesting set of observations of persistent fine-scale vertical laminations within Arctic clouds. The measurements are intriguing and the authors have conducted convincing tests to show that the laminations are not instrumental artifacts. The paper is largely descriptive: the authors describe the observations and the conditions under which the laminations have been observed, and briefly describe other observations of laminated aerosol and cloud structures. They offer little in the way of explanation for the observed phenomena, however, which seems to me a major shortcoming that should be rectified before publication in Atmospheric Chemistry and Physics.

A few specific comments:

The figures showing range-scaled photocounts on log scales are a little hard to interpret.

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How deep are the laminations/striations? Are they closer to 10% or 90% of the total backscatter? More quantitative information would help the reader consider the possible roles of cloud vs interstitial aerosol particles.

To first order, the laminations are reminiscent of the fog striations seen in cold pools under near stable conditions (Stably Stratified Atmospheric Boundary Layers, L. Mahrt, Annual Review of Fluid Mechanics 2014 46:1, 23-45). What are the wind conditions here? Wind profiles and Richardson numbers would be a useful addition, and potential temperature profiles would also be more instructive than the included temperature profiles.

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