

Interactive comment on “Solid hydrometeor classification and riming degree estimation from pictures collected with a Multi-Angle Snowflake Camera” by Christophe Praz et al.

Anonymous Referee #1

Received and published: 19 January 2017

Review of “Solid hydrometeor classification and riming degree estimation from pictures collected with a Multi-Angle Snowflake Camera”, by Prez, Roulet, and Berne, submitted to Journal of Atmospheric Measurement Technology.

This is a very well thought out study and the article is well written. It describes a sophisticated set of criteria, based on machine learning, with the algorithms developed from Principle Component Analysis and Linear Discriminant Analysis, to classify the shapes of ice crystals imaged by the MASC probe into one of six classes of the categories developed by Magono and Lee. My comments are fairly minor, but should be considered by the authors, and as such I recommend that the article is accepted for publication with minor revision.

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Major Comments

1. Korolev (GRL, 1999) states that “Using new technology imaging instrumentation with a resolution of 3 microns, recent observations in Arctic clouds have shown that such pristine habits only describe approximate 3% of the particles. The measurements were made from an aircraft during April 1998 and over a temperature range of 0 to -450C”. In view of this finding, does it make sense to classify particles into habit categories?
2. You may want to cite the article by Duroure (1982) in J. Rec. Atmos. that uses a Fourier analysis technique to classify the habits of article particles, and briefly discuss the merits of that approach and why it was not used in your study.
3. It would have been very useful to also describe the particles by their fractal dimensions as this dimension can be used to link the particles’ cross-sectional area to mass.
4. I feel strongly that, given that the MASC also measures the particle fall velocity, it would be very useful to rebuild your algorithms with that property also considered.

Minor Comments

1. Page 1, line 1: Remove “a”
2. 1, 18. “interpretation of radar retrievals” to “development of radar retrieval algorithms”.
3. 1, 18. “estimation” to “retrieval”.
4. 4, 4. “recall” to “cite”.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-417, 2017.

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