

Interactive comment on “HOLIMO II: a digital holographic instrument for ground-based in-situ observations of microphysical properties of mixed-phase clouds” by J. Henneberger et al.

J. Stith (Referee)

stith@ucar.edu

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General Comment. This paper includes a description of the HOLIMO II ground-based holographic instrument and a description of its data processing software. Three examples of super-cooled cloud measurements using this instrument are described. This paper will be of interest to readers of this journal, although some minor modifications are needed before publication. These are described below.

Line 69, The FSSP was originally developed by PMS, not SPEC. See, for example Baumgardner (1983) and references therein.

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Line 176. It is not clear where the control box and inlet box are in Fig. 2.

Figure 3. Is there supposed to be a blue dashed line and a blue dotted line here? It looks like there are two dashed blue lines.

Section 2.3. The analysis presented here assumes that all particles hitting the wall are lost. This seems reasonable for smaller water droplets, but larger ones may hit the wall and splash. Furthermore, ice crystals hitting the wall are likely not lost and may shatter into pieces. Some discussion of the likely impact of these two effects is needed, since they are relevant to the material presented in Section 4.3.

Section 3.1. This section could be improved by adding a bit more detail and perhaps more references. Not many readers will be familiar with terms such as “dilating the binarized voxels”, so more explanation would be helpful, such as a reference for “so-called connected component labeling” (line 338).

Lines 370-371. “Rather, to avoid these false particles, we excluded all smaller particles within a cylindrical volume around the larger particle.” How much of the total volume is excluded by this technique? Does this technique introduce a size bias in the sample volume?

Section 4.3 The possibility of re-suspension of ice from the surface should be discussed as a possible source of ice particles observed in this study. This is particularly relevant since the air masses likely experienced a moderate ascent over nearby glaciers.

Conclusion, lines 656-659. Although you observed mixed phase cloud for four hours, you have not measured the lifetime of super-cooled liquid water in these clouds, so these conclusions are not fully supported by the analysis presented here.

Baumgardner, D., 1983: An analysis and comparison of five water droplet measuring instruments, *J. Climate. Appl. Meteor.* 891-910

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