

Interactive comment on “HoloGondel: in-situ cloud observations on a cable car in the Swiss Alps using a holographic imager” by Alexander Beck et al.

Anonymous Referee #2

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The authors developed HoloGondel in order to use digital in-line holography to obtain the cloud particle size distribution, including information on particle phase (liquid or solid) and shape. This platform can observe vertical profiles of micro-physical and meteorological cloud properties and their temporal evolution on a cable car as well as the spatial distribution of the cloud particles in the sample volume at low cost for the in-situ cloud measurement. This will offer the opportunity to improve the understanding of micro-physical processes in clouds.

Totally, the concept of using holography for this application in which the wind speed is low and variable is a good one. The paper is thorough and clearly describes and characterizes the instrument. My only significant scientific criticism is regarding the lack

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of uncertainty ranges for size-distribution-derived values (number density, diameter, liquid water content) in Figures 7-10. These need to be displayed in the figures so that readers can assess the significance of the observed variability.

There are several other questions stated as follows:

1 Did authors simulate the flow field through HoloGondel or the open path configuration in-between the two towers? This helps to understand the possible ice shattering and distortion of the cloud particle distribution influenced by two towers. Flow distortion may be especially significant when the wind arrives at the instrument obliquely and is therefore influenced directly by the arms.

2 Can the direction in-between the two towers be adjusted perpendicular to the direction of wind to avoid wind blowing on the windows of tips? This could prevent the shattering of ice crystals.

3 It is better to provide readers hologram image samples showing the cloud droplets and ice crystals. For example, show the mixed-phase cloud holographic reconstructed images. This helps readers visually see the mixed-phase cloud particle samples.

4 In page 1 line 5, “ Based on a two dimensional shadow-graph the phase resolved micro-physical cloud parameters.....”, typically, the shadow-graph is a different technique from holographic reconstructed image. Also see page 5 line 20 “ The result is a set of two dimensional shadow-graphs, which are ...”. I recommend to remove the word “shadow-graph” since it implies an imaging method that does not involve coherent light.

5. In page 3 line 30, “ If this weight reduction leads to a reduced number of admissible passengers, “ could be “If this weight leads to a reduced number of admissible passengers,”

6 Page 7, line 20: I've never heard it called a "high resolution target"... just a "resolution target" or "resolution chart".

7 Equation 4: As typeset it appears that N and A are two variables... better to have

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them adjacent so they are clearly identified as numerical aperture.

Notes:

It is not a scientific statement, and in the end is up to the judgement of the authors, but I several times asked myself whether Dr. Fugal should be a coauthor on this paper. I don't know in detail, but my sense is that he may have contributed at a level that would warrant this recognition. I'm sure the authors have asked, but maybe it is worth offering again?

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