As a result to a comment by the Anonymous Referee #2, Dr. Jacob Fugal was added as a co-author on the paper. Therefore, he was given the chance to proof read the revised manuscript and his comments were also included in the final revised version of the paper. In the following the changes (blue) are explained. The page and line number refer to the location of the changes in the original manuscript. Comments on the spelling and grammar are also included but not listed below.

1.) p. 1 line 15: Specified the low understanding of mixed-phase clouds and added a citation.

The role of clouds remains a large source of uncertainty in climate and weather models (Flato et al., 2013), because our level of understanding of fundamental details of microphysical processes particular to mixed-phase clouds is low (Boucher et al., 2013).

2.) p. 2 line 28: Updated references for ground-based measurements with holographic instruments.

Digital in-line holography has been previously used in a series of airborne (Conway et al., 1982; Fugal and Shaw, 2009; Beals et al., 2015) and ground-based field instruments (Thompson, 1964; Kozikowska et al., 1984; Borrmann and Jaenicke, 1993; Raupach et al., 2006; Henneberger et al., 2013).

3.) p. 2 line 31: Added a reference for light scattering instrumentation.

Because images of the cloud particles are captured, no assumptions about the particle shape, orientation or refractive index is needed as is required for light scattering instrumentation (Lance et al., 2010).

4) p. 3 line 21: Added a paragraph about the relevance of the findings with HoloGondel for other clouds than boundary-layer clouds.

With the HoloGondel platform boundary-layer liquid and mixed-phase clouds in mountain valleys can be observed. However, the findings of these measurements are not only applicable to boundary layer clouds, but hold true for other cloud types if the findings are independent of the dynamics caused by the orography of the mountain valley. Therefore, measurements with the HoloGondel platform can contribute to a better understanding of fundamental details of microphysical processes in liquid and, in particular, mixed-phase clouds which are found in various cloud types.

5) p. 4 line 28: Added an information about the temperature sensor.

To protect the sensor from dew it is heated to a temperature of 8K above the ambient temperature and the measurement is corrected for the temperature difference between the heated sensor and the ambient air.

6) p. 5 line 24: Included more detailed information about the background division applied to the holograms.

This method reduces noise that is constant from hologram to hologram, such as particles stuck on the optical components or a non-uniform laser beam profile.

7) p. 6 line 9: Added an information about the attenuation of the laser beam.

Before the fiber, the laser beam is attenuated by approximately 70% using a neutral density filter to protect the fiber from damages.

8) p. 6 line 17: Added an information about the synchronization of the camera and laser.

The camera and the laser are software triggered and synchronized with a maximal frequency of 6 frames and pulses per second.

9) p. 7 line 26: Rewrote this sentence and added the information that also the regular pattern of the bars on the resolution target have an influence on the resolution limit for small reconstruction distances z.

Small deviations of the observations from the theoretical calculations for z < 1 cm are caused by disturbances from the virtual image and the regular pattern that the bars of the resolution target represent to the hologram.

10) p. 8 line 30: We added the information that also no precipitation was observed on the ground at the MeteoSwiss Station, because the radar cannot observe precipitation from low clouds in mountain valleys.

A patchy cloud cover in the morning and a uniform cloud cover in the afternoon was observed from satellite pictures, but no precipitation was detected by the nearby radar from high clouds and no snowfall was observed on the ground at the MeteoSwiss station at the Eggishorn.

11) p. 9 line 3: This paragraph was rewritten to make it more readable, but no new information as added.

For an approximately three-minute ascent or descent with the cable car, the HoloGondel platform captures a maximum of ~1200 holograms. For the Liquid Case, an average of ~240 holograms (4 L sampled volume) were analyzed for each run of the cable car for a total of 10 runs. Additionally, for one run 1200 holograms, 20 L of air was analyzed. For the Mixed-Phase Case 400 holograms (6.8 L sampled volume) were processed per run, for a total of 4 runs. When examining vertical profiles, at least 10 holograms (0.17 L sampled volume) are processed and presented as a group per level to obtain better counting statistics. This results in a vertical resolution of 5m (Fig. 9). For a uniform presentation of the data of the Liquid and Mixed-Phase case the data is presented in 75m intervals, which corresponds to 30 holograms for the Liquid Case and 50 holograms for the Mixed-Phase Case. An exception is the presentation of the height-resolved size distribution for the Liquid Case in Figure 8. For a clearer presentation this data is averaged over 4 height intervals of 150m.

12) p. 11 line 20: This paragraph was rewritten to improve the explanation of possible ice crystal sources and ice multiplication mechanisms to explain the observed ICNC.

An interesting feature is the high variability of ICNC (Fig. 10). Possible mechanisms to explain the observed variability of ICNC can only be discussed briefly, because meteorological parameters were not measured. Very localized high ice nucleation rates cannot explain the observed ICNC of several tens per liter at the observed temperature of -5 °C because the average concentration of ice nucleating particles observed at the nearby Jungfraujoch did not exceed 7 stdL^{-1} at -32 °C (Boose et al., 2016). Ice crystals may also fall into the cloud from an ice cloud lying above, which was observed on satellite pictures. On 23 February 2016, there was no ice cloud above and in the same temperature range simply a liquid cloud was observed instead. Secondary ice multiplication processes can further enhance the ICNC in the observed cloud. An influence due to ground-based processes is not expected because the cable car is more than 100m above the surface at 2700m, where the highest ICNC was observed. A much lower ICNC was observed where the cable car was closer to the surface. The Hallet-Mossop process is a possible ice multiplication mechanism that can explain very localized spikes of high ICNC, which is active at -5 °C and can significantly increase the ICNC (Hallet and Mossop, 1974). Also the small (< 13 µm) and large (> 25 µm) liquid droplets required for the Hallet-Mossop process were present at this day (Mossop, 1976, 1978).

13) p. 11 line 32: We included information on how the ice crystal shape can help to investigate the source of the ice crystals and if the ice crystals actually originate from snow canons.

Further investigation of the ice crystal habit from their two dimensional images is also available with the HOLIMO 3G instrument and can help to solve this problem, because ice crystals produced by surface-based processes or snow canons are expected to have a irregular shape. However, such an analysis was not performed for this case study.

14) p. 12 line 9: This paragraph is rewritten to avoid the impression that based on the comparison of the HoloGondel measurements at lower altitudes with MeteoSwiss measurements at the top of the Eggishorn the HoloGondel data is validated.

As described in section 2, wind measurements have to be corrected for movement of the cable car. In Figure 7 the corrected wind speed and direction is compared to the MeteoSwiss wind measurements at the Eggishorn at 2893 m.a.s.l.. The largest discrepancy for the wind direction is at the highest altitude interval of the HoloGondel measurements. Because this measurement point is the closest to the MeteoSwiss station at the top of the Eggishorn the best agreement is expected. The discrepancy is probably due to the orography just below the top station. As the cable car descends into the valley, at the beginning it travels along a little canyon which strongly influences the wind direction and possibly explains the discrepancy. Although the wind speed and wind direction measurements compare quite well for lower altitudes, this has to be interpreted with caution. The measurements of MeteoSwiss above the ridge of the Eggishorn might be quite different as it is freer airstream than in the valley where the wind is closely bounded by orographic forces.

15) p. 14 line 19: This paragraph is rewritten to improve the readability.

The HoloGondel platform has shown proof of concept that is can measure many vertical profiles of cloud microphysical parameters along with meteorological conditions unattended for days at a time. It has obtained example results from liquid and a mixed-phase clouds at the Eggishorn in the Swiss Alps.