Test

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Key Points:

- In-situ measurements of microphysical cloud properties with a holographic Imager
- Influence of in-situ cloud observations at mountain top stations by ground based ice enhancement processes
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Abstract

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1 Introduction

2 Field Measurements at the Sonnblick Observatory

2.1 Site description

This field campaign was conducted at the Sonnblick Observatory (SBO) situated at the summit of Mt. Sonnblick at 3106 masl (12°57′E, 47°3′N) in the Hohen Tauern National Park in the Austrian Alps. The SBO is a meteorological observatory operated all year by the ZAMG (Central Institute for Meteorology and Geodynamics). On the East and South the SBO is surrounded by large glacier fields with a moderate slope, whereas on the Northeast a steep wall of approximately 800 m descends to the valley. Part of the SBO is a 16 m high tower used for meteorological measurements by the ZAMG. The data presented in this paper was collected during a field campaign in February 2017.

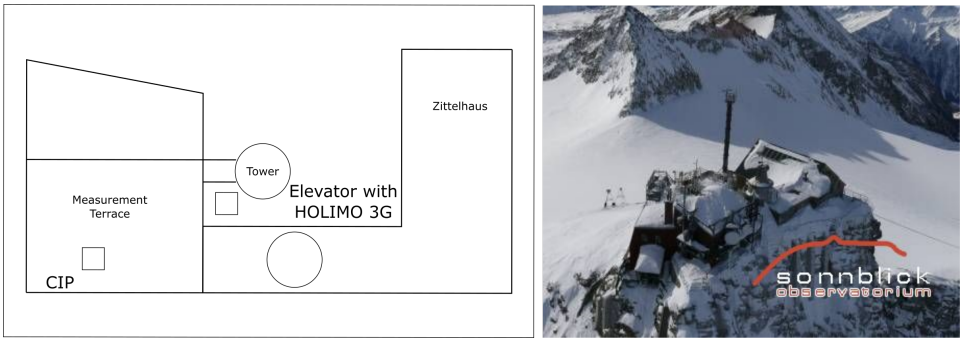

Figure 1. Short caption

2.2 Instrumentation

The microphysical properties of clouds (actually not only clouds!!) were observed with the HoloGondel platform citation(!!!) and the Cloud Imaging Probe (CIP) (CIP from Droplet Measurement Technologies; citation) of the Desert Research Institute, Colorado. The HoloGondel platform was mounted on an elevator that was attached to the meteorological tower of the SBO (see Fig.). This elevator allowed observing vertical profile of the microphysical properties of ice crystals. Therefore, the elevator was manually moved to seven measurement point at different heights above the measurement platform (0, 2.5, 4.1, 6.0, 8.1, 10.0, 12.2) as indicated in Figure (??). The holographic imager HOLIMO 3G, which is the main part of the HoloGondel platform, captures the information of a three-dimensional volume of air containing cloud particles on a single image. HOLIMO 3G has a sample area of ?? and ... . The open source software HoloSuite citation(??) is used to reconstruct the in-focus images of the cloud particles and their 3D position in the volume. Circular particles are classified as cloud droplets, whereas non-circular images are classified as Ice crystasl. Similar to a study by ... the ice crystals were further visually classified into three different groups: ... . Because the visual classification of several thousands of crystals is time consuming this subclassificaition of ice crystals was done only for two profiles on February 17th.

The CIP instrument was located on the north facing side of the measurement terrace (see Fig. ??). Because this location is in the wind shadow of the building of the SBO

during south wind cases, the CIP data is only analysed for February 17th, when the wind direction was from North. The CIP...

Meteorological data are available from the measurements by the ZAMG at the top of the meteorological tower. In addition, wind and temperature data are available from a 3D Sonic Anemometer () also located at the top of the meteorological tower.

3 Results

The data presented was observed on February 4th and 17th, 2017. Figure (??) show an overview on the meteorological conditions on both days. The main difference is the wind direction, which was from south on February 4th and North on February 17th.

3.1 February 4th

On February 4th a total of ... profiles were obtained over a time period of ?? hours. The temperature was ... and wind was from ??. The 3D Sonic Anenometer was not working on this day, because the heating was not sufficient enough to prevent the SONIC from riming. Therefore only 1 minute averages of ?? are available from the ZAMG. Most of the profiles were obtained when the station was in cloud expect for four profiles between ? and ? UTC. At this time the station was not in cloud, but a high cloud was present. Because south wind, no CIP data is available.

3.2 February 17th

On February 17th only four profiles were obtained during the entire day. The SONIC 3D Anenometer on top of the tower was working. Because the wind was from the north also data from the CIP is available.

4 Discussion

5 Conclusion

Acronyms

SBO Sonnblick Observatory

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