Atmos. Meas. Tech. Discuss., 8, C58–C60, 2015
www.atmos-meas-tech-discuss.net/8/C58/2015/

Atmospheric Measurement Techniques Discussions
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AMTD
8, C58–C60, 2015

Interactive Comment

Interactive comment on "Schneefernerhaus as a mountain research station for clouds and turbulence – Part 2: Cloud microphysics and fine-scale turbulence" *by* H. Siebert et al.

Anonymous Referee #1

Received and published: 9 February 2015

The paper is part 2 of a description of basic characteristics of the Schneefernerhaus Research Station (UFS); part 1 Risius et al., AMTD 5, 541-568, 2015. Such studies are important for further research work on this site.

Absolutely unusual is the definition of large scale turbulence (part 1 of the paper) and small scale turbulence. Turbulence in meteorology is classified into macroscale turbulence (synoptical scale) and microscale turbulence (Etling, 2008). In between is mesoscale turbulence (spectral gap), e.g. local circulation systems in the mountains. The large and small scale turbulence are both in the range of microscale turbulence. Probably the authors want to separate the microscale turbulence into that which has frequencies smaller than the frequencies of the inertial subrange (large scale), and that with frequencies of the inertial subrange and dissipation range (isotropic turbulence, small scale). The classification should be made clear in accordance with the textbooks of atmospheric turbulence and atmospheric boundary layer physics.

Sonic anemometers sample with a high frequency (e.g.100 Hz) and make an oversampling to exclude aliasing effects. A data analysis only makes sense with a time resolution of about 0.05 s because of the long measuring path (relation of time and space scales of atmospheric turbulence). The time resolution of hot wire anemometers or cold wire thermometers is much higher. Please make clear which sensor was used for which investigation.

Please give for Fig. 2 and 6 the date and the time, otherwise it is not clear if this is (partly) the same data set or not. Probably the data set of Fig. 6 contains the data of the red block in Fig. 2, but this information is missing in the legend. Why have you used a linear detrending? This is unusual (Finnigan et al., 2003) and generates an additional transfer function (Rannik and Vesala, 1999). Intermittencies are usually not periodic (Fig. 6). Could this be a locally generated eddy (Whiteman, 2000)? Fig. 2 and 3 are typical for turbulence near the ground. Fig. 4 only shows that the hot wire anemometer give reproducible values.

The reviewer is not familiar with cloud physics. This part should be reviewed by a specialist in cloud physics.

Contrary to part 1 of the paper the results are partly compared to laboratory and airborne measurements. Possible differences to results for the peak of the Zugspitze may be interesting.

Because part 1 of the paper can probably not be published, this paper should also include, after some modifications, some basic data of the Schneefernerhaus, and the dissipation analysis of part 1 can probably be partly included.

AMTD
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Whiteman, C. D.: Mountain Meteorology, Oxford University Press, Oxford, 355 pp., 2000.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 569, 2015.