Report on the paper "**Blowing snow detection from ground-based ceilometers: application to East Antactica**", by alexandra Gossart et al.,

This paper present a new application of the ceilometer, namely the detection of blowing snow events in Antarctica. As blowing snow measurements in Antarctica are quite scarse and because blowing snow is potentially an important contributor to the antarctic surface mass balance, this study must be considered.

The paper is divided into a technical part and an analysis of the results which is based on a comparison of ceilometer output with visual observations at Neumayer station, where a ceilometer was also deployed.

Results are up to now restricted to a count of the number of events and focuss on strong events, referred to as blowing snow in the paper, since the ceilometer analyses vertical profiles and since it is localised on the roof of both buildings of Neumayer and Princess Elizabeth (PE) station.

The calibration of the ceilometer remains an issue and I wonder if it will be possible. This is important since the use of a ceilometer would start to be relevant for blowing snow studies if a quantitative retreiving of blowing snow characteristics (height of the blowing snow layer, amount of transported snow) may be done. Is it the intention of the authors to perform such a calibration in the future? This point must be considered in the discussion and the conclusion in order to advice the reader about the potentialities and weaknesses of the study.

Nevertheless the paper represents a sufficient amount of work to be published. To my opinion the technical decription should be improved for a TC reader, especially a modeller. In fact there is too much or not enough. An alternate possibility should be to shorten the technical description and to do it in an other more specialized journal.

I had difficulties with a double meaning of some sentences (see specific comments below).

Specific comments:

p. 2, line 5. : the word "suspension" is defined here but is no used in the rest of the paper (see e.g., line 18 p.7), so that its intoduction here is not clear.

p.2, line 24, note that the precipitation process is also poorly constrained in Antarctica so that the authors have to face to one equation on SMB with at least two unknowns: precipitation and snow erosion by the wind.

p.3, section 2. What are the altitude of both stations PE and Neumayer. Is their climate (e.g., SMB, summer temperature, …) different? This will help the reader when considering the development of the BSD by using observations at Neumayer and using it for another location.

p.3, section 2.1. An introductory sentence stating that the ceilometer was not initially set up for measuring blown snow events would clarify the section. More generally the description here should contain more information related to a possible use of the measurements for a determination of blown snow characteristics.

p.4, line 1. : what is the raw resolution in time of the ceilometer?

p.4, line 2. : “spatial resolution”: do you mean “vertical”?

p.4, line 20. : please indicate for each instrument which measurement you intend to use in the paper, especially concerning the infrared pyrometer (see also p.6, line 2 where it is not said there for which purpose the cloud base height deduced from the brighness temperature is used). As for the next comment it is preferable to describe the use of an instrument in a single paragraph.

p. 5, lines 4-6. The ceilometer is described twice. Please rearrange the text.

p.5, lines 8-9. Please clarify the description of the MRR.

p.8, line 4. Please indicate the reason of the turning on/off of the heater.

p.14, line 13. What about the role of sastrugi in the evolution of blowing snow intensity?

p.14 – 15, fig. 8 and 9. How do you quantify from a statisticall point of view the differences between blowing snow and non blowing snow wind speed and relative humidity? What is your interpretation of the differences for the other variables?

p.16, line 2. What is the avantage of satellite detection?

p.16, line 14. Clarify “observations”

p.18, lines 17 – 18: “commission errors”: please clarify.

p.19, line 2. Is it possible to improve the set-up of the ceilometers on the field, and how?

p.20, line 3. : … designed to retreive blowing snow events but no drifting snow from ground-based ...