The manuscript "Quantifying the snowmelt-albedo feedback at Neumayer Station, East Antarctica" by Jacobs et al. presents meteorological data and simulation results to determine the albedo feedback effect at a single point for an ice shelf region of Antarctica. The chosen location (Neumayer Station) is well-equipped with instruments to measure four component radiation and sensors are maintained regularly. Such data allow for determination of contributing parameters such as surface roughness and microscale wind fields to estimate full energy balance. I consider the quantification of the melt albedo feedback as highly relevant for the cryospheric community especially for snow on ice sheets. However, some missing information as well as the confusing structure of the manuscript prevent publication in the current state.
We thank the referee for their constructive comments. They are addressed below in a structured way. Text in green shows text as it is now in the manuscript.

Major points of criticism are:

- The reader gets very confused by the structure of the manuscript. I recommend to revise carefully. The presented results sections consist of results and discussion, while large fractions of the first results (Section 3) mostly consist of data presentation. In addition, measured data and results simulated by model approaches are constantly mixed in Figures and text. It would be much easier to follow if measured parameters such as temperature, wind, humidity and radiation are separated from generated parameters such as Q_s, Q_l etc.
Thank you for this suggestion. We have separated the presentation of the local near-surface climate from the discussion of the surface energy balance. The near-surface climate discussion is moved to Sect. 2.

Same appears for manuscript sections and paragraphs: for instance, P6 L12-20 is solely discussion same as P6 L29-L3 P7 while before and after those paragraphs you mix measured data and model outputs.
We have moved blocks of text in Sect. 3.2 in order to present and discuss the results in a more logical manner.

In addition, the manuscript title indicates quantification of the melt albedo feedback, while only 2 pages and 2-3 Figures (out of 13 – not mentioning the numerous panels) are referring to snowmelt and albedo feedbacks. I understand that it is necessary to introduce the meteorological data, however, please carefully evaluate the necessity of the presentation of each parameter (Figs 6-9) with sometimes redundancies in the text. Some of the Figures would fit into a supplementary material section. I consider the colorbar in Fig. 7 as being useless. It is impossible to identify differences.
We have removed Figs. 3, 7, 8 and 11 to enhance readability.

- The nomenclature is sometimes not correct. First of all, what is "fresh snow"? I assume you refer to new snow, which would not be the correct nomenclature either. New snow refers to "Recently fallen snow in which the original form of the ice crystals can be recognized" among others presented in Fierz et al. (2009). The term recently implies a defined time frame. The snow you refer to in the manuscript can rather be defined as near surface snow or surface snow for which you should define a depth range as well. Such a surface snow undergoes rapid transformations especially for polar regions on ice sheets.
With fresh snow we refer to new snow as defined by Fierz et al. (2009). The contribution of "fresh

snow" as it is in the albedo parameterisation solely comes from recently fallen snow in a defined time frame, namely the timestep of the model. Snow that was already present in the layer from the previous timestep is considered "old snow", which undergoes the dry snow metamorphism. We have now made this more clear in the manuscript by changing "fresh snow" to "new snow" throughout the manuscript.

I am not sure I understand which formulations are used to estimate snow metamorphism at the surface. It might be beyond the scope of the manuscript but you should distinguish between temperature gradient metamorphism (TGM), equi-temperature metamorphism, melt-freeze metamorphism and Firnification and pressure metamorphism. The latter two can be excluded for surface snow but simply assuming grain growth by melt-freeze metamorphism has to be discussed more in detail. Can you present in-situ data on surface densities and grains recorded by the staff at Neumayer? Please see the following paper for more details on metamorphism (Calonne et al. 2014;doi:10.5194/tc-8-2255-2014). Grain size might be a good tuning parameter but is not a parameter quantifying adequately properties of snow. For the here referred optical properties, it is recommended to use the optical-equivalent grain size or specific surface area (SSA). Again, this might be beyond the scope of the paper but you should at least be up to date with nomenclature and references.
We have added the formulation of dry snow metamorphism. Unfortunately, no in-situ data on surface densities or grains are available from Neumayer. We have now included a comparison with measurements on the Antarctic Plateau (Picard et al. 2012; doi:10.1038/nclimate1590). Although the local climates are very different, the comparison shows that the grain sizes measured on the plateau in summer are similar to the grain sizes modelled at Neumayer in winter. Neumayer winter temperatures are somewhat comparable to plateau summer temperature. We added to the manuscript:
[2.2]
Dry snow metamorphism is parameterised following Kuipers Munneke et al. (2011b):

$$\frac{\mathrm{d}r_{e,dry}}{\mathrm{d}t} = \left(\frac{\mathrm{d}r_e}{\mathrm{d}t}\right)_0 \left(\frac{\eta}{(r_e - r_{e,0}) + \eta}\right)^{1/\kappa}, \tag{9}$$

where $r_{e,0}$ is the new snow grain size, and the coefficients $\left(\frac{\mathrm{d}r_e}{\mathrm{d}t}\right)_0$, η and κ are obtained from a look-up table. This look-up table is compiled based on simulations with the SNICAR model (Flanner et al., 2006), which calculates the snow metamorphism resulting from temperature gradient metamorhpism.

[4.1]
Libois et al. (2015) and Picard et al. (2016) present observations of snow grain sizes on the Antarctic plateau during field campaigns in 2012–13 and 2013–14 as well as estimates from satellite observations. On the plateau, summer temperatures are comparable to Neumayer winter temperatures. Libois et al. (2015) report summertime snow grain size estimates of approximately 0.11 mm (Fig. 6 in their study, reported as a specific surface area $\mathrm{SSA} = \frac{3}{\rho_i r_e}$, where ρ_i is the density of ice and r_e is the snow grain size). In our study, wintertime snow grain sizes approach 0.21 mm. The difference is expected as the plateau is generally much colder than Neumayer. The seasonal cycle of modelled average snow grain size in the upper 7 cm (Fig. 8) is comparable to the one presented in Libois et al. (2015).

- Please quantify parameterizations (e.g. P9 L16-17).

We have added the ranges that were probed for the new snow and refrozen snow grain sizes. These parameters were varied within reasonable ranges to optimise the results: new snow grain size between 0.04 mm and 0.3 mm, refrozen snow grain size between 0.1 mm and 10 mm.

- Please be consistent: snow pack versus snowpack. I recommend to use snowpack as stated in Fierz et al. 2009. Same appears for T_s as surface temperature or T_0 as in Fig. 7 or P3 L10.
We have changed snow pack to snowpack throughout the manuscript. T_0 on P3 L10 should have been a T_s.