

Dear Anonymous Referee #2,

Thank you for your letter. The comments of the associated editor and of the reviewer were most helpful and we would like to express our gratitude for the constructive support. We followed all suggestions for changes and hope to have answered all questions. Reviewer comments are listed as italic, and the following answers are below.

Best regards,
Monika Wittmann

Changes:

Comment Reviewer:

- *Figure 2 and associated discussion on page 52: Neither the figure caption nor the text is clear on exactly which period is being displayed here for the modelling results: The glaciological year 2012-2013, the entire calendar year 2013 or the part of 2013 leading up to the sampling expedition in October 2013 (data from samples collected during that expedition are displayed along with the model results in the figure). It is probably the period JD 130-283, but this should be explicitly mentioned.*

Answer: Line 120 states: We used dust measurements in snow for the year 2013, since no measurements were available for 2012, and compared them for the same time period (until October 2013) with the simulated spacial dust distribution over Vatnajökull by FLEXPART.

Since this doesn't seem to be clear enough the exact period for the flexpart model run 2013 is January 1st until October 7th, the day when the surface dust has been taken on the glacier (=DOY 280). This has been clarified in the text now and in the Figure 2 caption.

- *The two case studies on Dust events 1 and 2 (Figures 3-5) are well described and the authors present good reasons for focusing on those events, comparing measured albedo drops with modelled dust deposition. Since both are, however, spring events, it is a bit surprising that other events do not receive comparable scrutiny, like for example the summer event E5 during JD 220-227 (Fig. 3), or the September events after JD240.*

We have chosen to only describe 1, maximum 2 dust events in detail, otherwise it would have been a too long description. Therefore Table 2 and 3 are there to show all dust events and their most important parameters. Event 5 has not been chosen to be described in detail since the dust peak in B13 occurs at the same time as the highest temperature of the year (almost 5°C), and event 6 has been an exceptionally long event of 2 weeks, with a lot of precipitation and as well positive temperatures. The two events with the highest certainty that albedo drop is mainly/only caused by dust has been chosen, which cannot be guaranteed for E5 and E6.

- *L42-43 "The snow-albedo feedback, where radiation absorption is enhanced due to impurity content in snow and ice is indicated by complex processes. . ." Further clarification needed here, what is meant by "complex processes" ?*

Has been changed to: Due to impurities in snow, the albedo of the snow can be reduced. This involves direct albedo reduction by the impurities but also changes in the snow grain size triggered by the impurities especially at temperatures close to the melting point, which can strongly enhance the albedo reduction.

- *L64-66 "Iceland is one of the most active aeolian places on Earth, even though it is not situated in an arid climate (Arnalds et al., 2016). Due to the large area of sandur plains and strong winds resulting in numerous dust events." "aeolian place" is not well put, and second sentence is subordinate, meaning that it shouldn't stand on its own.*

The sentence has been rephrased.

- *L212 Dynjgusandur → Dynjgusandur*

This has been changed

- *L230-231 In Table 1, the measured and modelled dust deposition during the years 2012 and 2013 for stations on Brúarjökull, our main area of investigation, were reported. → Table 1 gives the measured and modelled dust deposition during the years 2012 and 2013 for stations on Brúarjökull, our main area of investigation.*

This has been changed.

- *L338 “magnitude” should probably be “order of magnitude”*

This has been changed.

- *L350 which seems to be overestimated → which seems to be an overestimate in the light of results presented here.*

This has been changed.

- *L370 supper site → upper site*

This has been changed.

- *L390 and L606 Grímsvötn eruption → Gjalp eruption*

This has been changed.