

## ***Interactive comment on “Boreal snow cover variations induced by aerosol emissions in the middle of the 21st century” by M. Ménégoz et al.***

**M. Ménégoz et al.**

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We would like to thank Referee #4 for its useful and thorough reviews. Our replies to its comments follow below. Note that a revised version for our manuscript can be found in the supplementary material associated to our answer to Referee #1.

1. First major point: description of the snow cover and its albedo. We ask Referee #4 to refer to the responses provided to the others referees:

- Point 6 of the response to Referee #1: snow scheme, snow albedo parametrization.
- Point 7 of the response to Referee #1: Representation of snow melting in our model.
- Point 7 of the response to Referee #2: parametrization of snow grain size and snow

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ageing.

We added several statements in the revised version of our paper concerning these topics. However, we decided not to show snow melt patterns, as our paper focus on the aerosol/snow albedo interactions, and not on the snow cover physics. If interesting, such discussion would however necessitate more analysis, which could appear to be out of the scope of our study. Moreover, as explained in the response to Referee #2 (point 2), it would be very challenging to explain the respective contributions of aerosol forcing and atmospheric feedbacks to the modelled change of snow melt patterns.

2. See point 2 in the response to Referee #2.
3. We modified the title (see point 2 in the response to Referee #1)
4. It is difficult to shorten the abstract (especially as the other referees asked us to put some additional information in the abstract).
5. Figures: see point 26 in the response to Referee #2.

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