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Interactive comment on "Assessing the performance of a distributed radiation-temperature melt model on an Arctic glacier using UAV data" *by* Eleanor A. Bash and Brian J. Moorman

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Thank you for your comments on this manuscript. Please find below our responses to your general comments. In the updated manuscript, we will consider all further points you raised and try to incorporate them.

1. We agree that in several places the manuscript will benefit from better explanation of our methods and choices. We will specifically address the references you point out, but also look for other opportunities to further clarify the modelling methods.

2. We will state this explicitly.

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Discussion paper

3. The scaling was indeed performed once for each image, and we will clarify this in the text. Regarding the choice of scaling parameters, the darkest pixels in the image do correspond to surface debris on the glacier, and thus the lower end of the albedo spectrum is fixed to those locations. We chose this approach in favor of a particular off-ice location because we have not measured albedo off ice and can't say with certainty that the albedo of any particular location is 0.1. With respect to the upper end of the spectrum, we selected the average AWS albedo for several reasons: 1) because the AWS location is relatively clean ice it is likely representative of the highest albedo in the study area; 2) because the imagery was taken at a particular point in time it reflects an instantaneous (almost) albedo, but must be applied over multiple days, we feel an average is a better representation of daily surface characteristics; 3) because albedo varies with solar angle we were hesitant to assign the maximum measured albedo to the highest values as it would likely over estimate albedo.

4. We will include a further discussion of the estimated uncertainty associated with model parameters. We originally considered the inclusion of scatter plots as you suggest, but given that the dataset include millions of points, these figures tend to be too noisy to visualize patterns effectively. It is a problem with UAV data, which is difficult to address.

5. We will elaborate on the sources of uncertainty in the calculation of surface lowering from UAV data and clarify further the use of this calculation as a ground truth, which we refer to as a measurement.

6. We agree that the radiation methods could be strengthened by further discussion. We have performed some preliminary sensitivity analysis in exploring different modelling options for solar radiation and will include some discussion of this in the revised manuscript.

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