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Atmospheric Chemistry and Physics Discussions

Interactive comment on "UV albedo of arctic snow in spring" *by* O. Meinander et al.

O. Meinander et al.

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Reply to Referee # 2

The Referee made valuable comments which will improve and clarify the content of the paper. Referee#2 considers that the article contains new and important results. The Referee also thinks that experimental studies like this are fundamental and should be encouraged. However, the Referee would like to see separate sections on discussion and conclusions, and also the discussion to be more concise, and most of the figures to be revised. These suggestions will be followed.

Our reply to Referee's specific comments:

- the Referee is right, that the spring thaw occurs on day 66 not 56, the typo will be corrected

- Section 3.3., line 22: time refers to the day of the year; this will be clarified

- yes, we have measured in 2008 but the data are not yet analysed; we will make a new study and then we'll find out if these equations hold more generally or not, unfortunately this information will not be available for the current study

- 26 and 29 March are after springthaw so the Referee is quite correct when making a point; we will remove the errrorneous statement

- we will include information on the exact time of solar noon to Table 1

- page 4169 line 6: we will make the sentence more clear by specifying that here we are talking about the diurnal change in albedo

- we will delete the first sentence of the Chapter 5 in the Discussion as it contains basically the same as already told in the Introduction

- the Referee makes a good point on the diurnal decline occurring later in the Antarctic than in the Arctic. Our speculation on the reason is hypothetical and may be erroneous. There seems to be some factor that increases the effectice grain size in the Antarctic conditions only later in the afternoon, but we do not know the reason. We will remove the sentence "That can possibly be explained by..." and only state the facts that have been observed

- page 4175; the reference for the snow classes will be added: STURM, M.; J. HOLMGREN and G.E. LISTON. 1995. A seasonal snow cover classification system for local to global applications. J. Clim. 8: 1261-1283.

- Table 4, Julian days will be added, and "overcast" will be used instead of "full cloudy"

- Figure 5: There are two grids underneath the snow flakes. Numbers 1 and 2 in the figure indicate the grid sizes. We will clarify this in the Figure capture.

- Figure 6: the connecting lines will be removed between the data points; we will consider deleting Fig6, as the most essential snow depth information is in Fig 8, too

- Figs 7-11 the changes will be made as suggested by the Referee

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- Fig 12, the measured data (not calculated) are shown, this will be clarified

- Figure 13 will be revised, possibly only May data will be shown or only cases below a selected representative SZA value (e.g. 85 degrees) will be given

- all the technical corrections specified by the Referee will be made

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 4155, 2008.