

Interactive comment on “Snow physics as relevant to snow photochemistry” by F. Domine et al.

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All 3 referees agree that this paper is a useful review paper (I would consider it more as a tutorial for atmospheric chemists), and that it should be published after some revisions. They all make specific recommendations, and I would expect the authors to consider all of these.

Referee 1 makes a somewhat more substantial comment that the remote sensing section is out of place. The authors should consider this, and either shorten it, or make clear its relevance here. This referee also criticises the choice of references, including the self-citation rate and specificity of references: please bear this in mind when editing.

I also wanted to make a specific comment about the issue raised by Warren, that recent results suggest a much smaller extinction coefficient and larger e-folding depths than

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those that were in the literature until recently, and than those quoted in this paper. I would certainly like the authors to acknowledge and discuss these new data, but in a balanced discussion. While the Warren et al (2006) paper undoubtedly contains the best new data, the conclusion of an exceptionally long e-fold depth is based only on their layer C (from their layer B a much shorter value would be chosen). The conjecture that the difference between the layers is due to higher levels of soot impurity after 1996/97 is conjectural, and not entirely backed up by their data (Warren, Fig. 6; also, since the station was summer only until 2005, it is surprising if the whole profile was changed in the way shown). It's difficult to discuss the data of any other authors, because nearly every study has been done with snow from rather near to a station. I therefore propose that the current authors explain that there is a discussion going on; that more data are needed; that a change as proposed would have a profound effect on estimates of the importance of snow photochemistry; but that the jury is still out.

If the authors make a detailed revision of their paper as proposed by the three reviewers it is likely to be publishable in ACP.

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