

Interactive comment on “Inferring snow pack ripening and melt out from distributed ground surface temperature measurements” by M.-O. Schmid et al.

Anonymous Referee #3

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Summary:

Based upon my knowledge of the literature, this paper is of interest to the Cryosphere community for 2 reasons: 1) the development of a single methodology for defining MD and RD which can be used at sites which may or may not have “simple” snowpacks which last throughout the season or more transient ones, and may or may not have permafrost, and 2) the characterization of fine-scale variability of GST in complex, rocky terrain. The lack of validation makes it difficult to use this as a way of “validating” grid-based models, however. And there were sections that merely replicate work that has been done elsewhere in greater detail. It does need to provide additional background

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on the study sites and a few additional figures as described below. Careful editing of the grammar and spelling would be helpful as well. Acceptable with minor revisions.

Major Comments or Questions:

1. An example showing the standard deviation and why 0.4 was selected as a threshold would be really helpful as no support is shown for this threshold and the scale in later figures is not sufficient to allow the reader to evaluate this very significant decision.
2. Table A1 is not useful if there is no information about individual site characteristics is given... There isn't even a basic map showing the study area location and where these sites are. There needs to be. There also needs to be footprint-level information, either incorporated into Table A1 or in a separate place, describing the slope, GCT, etc.
3. Review of North American references would be helpful as these seem mainly from European sites and there has been a number of recent, relevant work on snowpack distribution in the States and Canada.

Minor edits and/or suggestions: 1. Abstract Line 2 – “diverse” spelling typo 2. Abstract Line 19 – “measured” should be “measurements” 3. In abstract the authors state that there are 40 sites but later in paper they say 39. These should match. 4. Pg 564 line 21-23 – and lots of other purposes as well! 5. Pg 567, line 1 – “set up” not as precise as “design”. 6. Pg 568, line 1-4 – For which iButtons? Rephrase as daily stdev is used for days??? 7. Section 3.2. Citations or documentation is needed based upon whether this is a theoretical discussion or one based upon observations at this site. 8. Pg 570. Section 3.3. One might assume that this was also aggregated up to the footprint level, but it should be specified clearly. 9. Pg 570, line 22 – should read “located upon a ridge composed of gravel” 10. Pg 571, line 1 – Don't capitalize “overview”. 11. Figure 3 – GCT should be defined and described in the caption to make it easier for the reader. 12. Figure 4 – this really doesn't provide new information although I suppose it does support previous, similar findings. 13. Figure 5 – Could show GCT here as well? It isn't very clear what the authors are illustrating with this graph as there is no order to the data – perhaps a box-and-whiskers plot would be more effective? There

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needs to be some additional information. 14. Pg 573, lines 12 and 15-16 – These seem contradictory – needs rephrasing and more clarification. 15. Pg 575. Mention no validation – might consider the recent discussion on Cryolist about remote digital cameras.

Interactive comment on The Cryosphere Discuss., 6, 563, 2012.