

## ***Interactive comment on “Modeling the statistical distributions of cosmogenic exposure dates from moraines” by P. J. Applegate et al.***

### **Anonymous Referee #2**

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I was happy to see a new installment in the long lived discussion of moraine boulder dating. The authors do an excellent job in reviewing and presenting the prior landmarks in this field. However, I felt that I was left with relatively little new insights into the problem after having read the manuscript and therefore rank the scientific significance as good/fair.

However, this manuscript is highlighting the importance of the inheritance to the dating accuracy, which although recognized and discussed before, has not received as much attention as the matrix degradation.

I have some additional minor comments listed below.

Minor comments: p. 1407 Row 13: end of row add: cosmogenic isotope. At this point

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it is not clear what is inherited. Row 22: “left-skewed” seems somewhat arbitrary, what about just saying that it produces distributions that are skewed towards the younger ages.

p. 1412 row 2: The first author should be proud of all the manuscripts he is working on, however, I find it inappropriate to reference a manuscript that is not publicly available for readers and in the worst case may never get published. Therefore all the references to Applegate et al 2009 should be removed from the manuscript. Row 25: “shorter” seems awkward term, what about just saying that the moraine degrades or erodes.

p. 1417 row 23: I don’t think I have ever heard of sublinear, should it be non-linear. Maybe it could be double checked.

Fig 1. The lowest of the three panels shows the initial (dashed) and the final (solid) profiles of the moraine cross section. If this profile follows the model suggested in the text (slope dependent degradation) then the final profile may not show the same undulations as the initial. Rather the final should be a smoothed version of the initial. The authors know this very well, and this appears to be just a simple mindless mistake.

Fig 5. I find that figure 5 is not needed at all.

Fig 6. Panel d was difficult to find. Maybe additional info on its location would help.

Fig 8. Lowest panel (diffusivity). It may be a good idea to highlight that it is the power of ten that is changing between the runs. The small x went almost unnoticed by me.

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Interactive comment on Geosci. Model Dev. Discuss., 2, 1407, 2009.

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