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Hydrology and Earth System Sciences Discussions

Interactive comment on "A triple-moment blowing snow-atmospheric model and its application in computing the seasonal wintertime snow mass budget" *by* J. Yang et al.

Anonymous Referee #2

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This is a very interesting paper and definitely adds value to the science in the snow mass budget. I have following review suggestions for authors to consider.

(a) Authors estimated surface sublimation and blowing snow transport for the snow mass budget. Authors pointed out that air temperature, relative humidity, and wind speed are three important variables those affect most on the snow transport and surface sublimation. It would be nice to see which variables affect most on the surface sublimation and snow transport. Figure 1 indicates that snow rate is higher when temperature is lower and relative humidity is higher. But it is not consistent. Blowing snow transport may be higher at high wind speed, but Figure 1 shows that higher snow rate

is observed for lower wind speed. This may be because of increasing surface sublimation. This raise a question that at lower wind speed air may not carry moisture for a long distance over land surface. So, have you considered changing the RH of air spatially in your model. (b) You have considered 18km grid resolution. Highly terrain land and presence of vegetation may decrease the wind speed because of friction. How did you consider those in your model?

Minor suggestions Page 934 line 1: a reference is required for "parallel MC2 (version 4.9.8)", because it is not familiar to all readers.

Page 936 line 28: better to mention the blowing snow criteria.

Page 938 line 11- 14: what do you mean by 54-hour integration? Explain more explicitly.

Page 939 Equation 1: Give little explanation how did you take measurement of each terms in the right hand side.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 929, 2010.