Geoscientific
Model Development
Discussions

Open Access

Interactive comment on "A two-layer canopy with thermal inertia for an improved modelling of the sub-canopy snowpack energy-balance" *by* I. Gouttevin et al.

Anonymous Referee #2

Received and published: 20 March 2015

The authors did a fantastic work on the snow modeling and significantly contributed to the modeling of sub-canopy snow in boreal regions. The authors demonstrated that the use of a two-layer canopy with minimum stand-related parameter requests can significantly improve the modeling of sub-canopy radiations for snow accumulation and melting. If this scheme was widely incorporated into the next generation of land surface models, this will significantly improve our understanding of the snow dynamics and their mechanisms in boreal regions. I recommend this paper to be accepted in Geoscientific Model Development if the following minor revisions have been considered. 1. The authors showed that the shortwave and longwave radiation below the canopy showed little sensitivity to the fraction of LAI attributed to the leafy canopy

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

layer. I am wondering how about the sensitivity of sub-canopy snow mass to this ratio. In addition, in Page 237/lines 12-16, the authors found that the best-fit value of the extinction coefficient would be changed if different time period was used in the process of model calibration. How about the sensitivity of sub-canopy snow to this parameter? 2. To be more illustrative, the error statistics should be indicated in Figure 3. 3. Page 210/line7: atmosphere-to-soil-through-canopy-and-snow should be better simplified. Page 211/line 24: "to the author's knowledge" should be changed into "to the authors' knowledge". Page 212/line17 and Page 215/line 19: please rephrase the sentence

Interactive comment on Geosci. Model Dev. Discuss., 8, 209, 2015.