

## ***Interactive comment on “ISBA-MEB (SURFEX v8.1): model snow evaluation for local-scale forest sites” by Adrien Napoly et al.***

**Anonymous Referee #2**

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This study presents the evaluation of the ISBA-MEB snow model in 3 forest sites in Canada. Despite being based only on 3 stations, these are well known and with good quality observations that allow a detailed evaluation as presented in this study. A sensitivity analysis is also performed and identifies 1 important parameters of the MEB scheme which is relevant for the snow simulations. This is a relevant study for the snow community as it highlights several processes important in the modeling of snow and soil conditions in forest areas. It is also relevant for a wider climate community due to the role of these areas in the response to a warmer climate. The manuscript is well organized and clear. I only found a few details, listed below, that require some attention from the authors.

Fig.1 legend is missing

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Fig.2 Which snow density was assumed ? Snow cover fraction is a function of snow depth (D, m) and not Snow Water equivalent. Please indicate which density is used, or plot snow fraction as function of snow depth.

Line 288: “In order To” : “In order to”

Line 367: Defining last day of snow when  $SND < 0.2m$  and below that for the following two weeks. The mean annual cycle of snow depth in Figure 6 shows that ISBA simulations on average never reach 20cm of snow depth in the OAS site. In years when  $SND$  is always  $< 0.2$  how does this identification of last day of snow works in a simulation ? A value of 0.1 seems more reasonable. Would changing from 20 cm to 10 cm change significantly the metrics in Table 5 ?

Line 377; “Also, Fig. 5 seems to indicate that the snow density is well modeled since underestimation or overestimation of  $SND$  and  $SWE$  are consistent for both models.” This is true for OAS and OJP, but the OBS results in year 2 and 3 (Fig 5) indicate a reasonable performance of snow depth but a large underestimation of snow mass in year 2 and over-estimation in year 3 (also OJP in year 3). Could this be related with snow density errors linked with different winter conditions between year 2 and 3?

Fig 7. Missing panel names (a,b,c) which are used in the text (e.g. line 399). The 3rd date tick seems wrong “03/29/2006” should be “03/28/2006” ?

Line 437: Suggest to remove “somewhat”

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