

Interactive comment on „Micrometeorological processes driving snow ablation in an Alpine catchment“ by R. Mott et al.

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For a long time, particularly since the 1970s, micrometeorologists, ecologists and glaciologists have been engaged in the design and improvement of models of the melting of snow. The growing capacity of computers made these models increasingly complex, but they concentrated on energy balance and ablation and took the snowpack and glaciers as given. It was only fairly recently that the snow community became concerned about modelling the small scale (slope scale) distribution of snow on the ground. Rebecca Mott entered this novel era of research at its early stage and was indeed able to promote it. This is the fourth of a series of papers that treat micrometeorological and slope scale effects of inhomogeneous distribution of the snowpack (Mott and Lehning 2010, Mott et al. 2010, 2011).

One essential outcome of this study is that over patchy snow fields internal boundary layers develop which are horizontally inhomogeneous and together with the buoyancy over inclined surfaces preclude the use of conventional stability parameters. The model does use them, which leads to the strong differences to the results of eddy correlation measurements in Fig.10. Changing back and forth between measurements and models the authors succeed in presenting an interesting picture of the edge effect and internal boundary layers, both depending on horizontal scale.

I suggest that the following alterations and clarifications should be made:

P 2163, line 4: how variable is the initial snow depth distribution from year to year?

2163, 11: what is meant by “an atmospheric model”?

2165, 22: omit “simply”

2167, equ.1: add  $\rho c_p$

2168, equ.3 and line 22: give an example of how  $C_h$  changes if  $z_o$  is changed by a factor of 2 and add your opinion of the uncertainty of  $z_o$ .

2169, 4: “friction” instead of fiction

2177, 9 and Fig.9: is L determined from measured covariance or from modelled fluxes? Why is there unstable layering ( $L < 0$ ) in the morning hours when TA is always  $> TSS$ ?

Make a comment on positive values of TSS.

2177, 23: “has been cooled by longwave radiation” I would prefer “by a negative energy balance”