

Interactive comment on “The impacts of moisture transport on drifting snow sublimation in the saltation layer” by N. Huang and X. Dai

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Received and published: 25 March 2016

In this study the authors used a 2D model for studying snow sublimation in regards to its capacity to impact saltation layer evolution. For this aim they used a solid particle transport modeling combined with transport equations for potential temperature and specific humidity. The modeling mimics splash and take-off processes as usual. The two way coupling between sublimation and velocity is acted via a rough term inside longitudinal velocity field evolution equation. No four way coupling is introduced. The paper described clearly how all processes are accounted for.

Some important points are the following :

The two way coupling has to be more deeply discussed as it is proposed : what are the hypothesis leading to this formulation ? Furthermore even if variation of temperature

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are low it could be discussed if it could induced some effects on velocity field particularly where there is a large concentration of snow particles. It is relatively easy to add in such modeling these effects. Concerning the four way coupling and contrarily to sand it could probably modifies significantly the budget close to the ground. As written by the authors such modeling is not time consuming in so it would be interesting to time increase the computational runs to observe if the various time evolutions of the shown quantities are stabilised.

Concerning results it would be interesting to plot snow particles concentration profile evolutions. I agree that it would be interesting to account for turbulence and to compare with experimental results.

could you check equation (14) (or may be I did a mistake but molecular weight of water have to be taken into account in the first term of the denominator) ? Some details concerning some threshold or constant as the one for take-off have to be given as they are crucial.

However the aim of this work is interesting and also the way to treat it.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-795, 2016.

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