**Geoscientific
Model Development
Discussions**

Interactive comment on "The detailed snowpack scheme Crocus and its implementation in SURFEX v7" *by* V. Vionnet et al.

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Regarding the content of the paper and my 2 years perspective of Crocus model testing at Polish national hydro-meteorological service, it's like obligatory to mention, that because of the transparent structure of the publication and very well depicted general view of model utility, new release of Crocus description, is really friendly, in terms of understanding and following the ideas pointed in it. On the other hand, from personal point of view (i.e. Crocus enduser/tester), for gaining best form and content of the article, some specific extensions of the paper could be added.

Section 3.1, equation 2,3. Even if the main goal of the paper is a general overview of the model, I would attach some specific plots which refers to those basic formulas mentioned in the text, which were not as that much presented in Crocus descriptions

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until now, yet. Couldn't it be worth to enclose the plots of "dfall" and "sfall" as a function of typical values for wind speed?

Section 3.5, equation 9. Staying with the same argumentation like in comment for section 3.1, I would suggest to add the plot, which shows the behaviour of the function, mentioned in the line just below the equation 9, taking the typical range of the density as an argument.

Section 3.5. Considering the issue of the extension for Mobility index, I would suggest to add a comment, that the density values larger than 330 kg/m3 (taken as an average for the whole depth of the snow pack) are also quite often encountered in the Carpathian Mountains (this is through, at least for north-west part of it, i.e. in polish Tatras, where right quality of data set, is available for last 50 years), which means, the development mentioned in this part of the paper, could be potentially very useful, not only for polar snow regions.

Section 3.12. Regarding the word "time step", which occurs in this section and the description of numerics used in Crocus/SURFEX (implicit and centred Cranck and Nicholson method - the information taken from former Crocus documentation, still valid for the actual release of the model?), wouldn't be useful to mention the name of numerical scheme, used in actual release of the model, with additional comment about the typical values of time step applied for integration?

Section 4. Supposing, that the article is addressed to quite wide audience and considering the context of potential enlarging the community of Crocus/SURFEX snow pack prognostic application users, I would suggest, the additional information could be provided, that stand alone version of Crocus/SURFEX is NWP model input independent - i.e. if mentioned in section 2.3 fields are available in adequate format, then there are no particular constrains, for feeding Crocus/SURFEX stand alone mode, with any kind of NWP model output, for the aim of snow pack prognostic calculations (that is, how I get the issue of meteorological input, necessary for using snow pack features prognostic

utility, applied for single points localities). Hadn't it better, for the transparency of the publication, if this kind of statement would be explicitly pointed, if not in the section 4, then possibly somewhere else, within the discussed paper?

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