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comment

Interactive comment on "Sensitivity of snow models to the accuracy of meteorological forcings in mountain environment" *by* Silvia Terzago et al.

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Although limited to a single site and short on mechanistic explanations, the evaluations of several models in simulating snow mass, depth and density with several forcing datasets in this paper are of value (another with similar aims that should be cited is https://journals.ametsoc.org/doi/full/10.1175/JHM-D-15-0013.1). Measurements of outgoing shortwave and longwave radiation are mentioned but not used in the model evaluations; these might provide more insight.

p2, line 28

There is no need for feedbacks for early differences in snow simulations to persist throughout the winter if the imposed conditions remain too cold for melt.

p3, line 22

delete "air" in "open air sites"

p3, line 25

Specifically, Rutter et al. (2009) found that benefits from calibration at forest sites did not transfer to nearby non-forested sites. Direct calibration at the non-forested sites would almost certainly have improved simulations.

p6, line 18

I do not think that wind direction is needed to force the snow models, and please clarify whether any of them use surface temperature.

p7, line 1

"both liquid and solid fractions" means that total precipitation is measured, not separate snowfall and rainfall.

p7, line 23

After reading this, I expected Appendix A to give details of the vertical gradients used for temperature and precipitation interpolation.

p8, Table 1

Information on the elevation of the reanalysis grid points would be interesting here or in the text. Also, how much gap-filling was required in the station data?

p9

I am confused by SWIN-CLS. If R is measured radiation and SWIN is modelled clear-sky radiation, I don't see where the MSG cloud masks are being used. If R is incident solar radiation in cloudy conditions, isn't equation 2 the wrong way round?

p9, 13

Linear interpolation of sampled radiation fluxes rather than solar elevation-based interpolation of accumulated fluxes will be biased. How do average fluxes compare? (briefly mentioned in 5.3 and turns out to be a source of error)

p10

Is the partitioning of total precipitation into snowfall and rainfall only applied to station measurements (in which case I expected to read about it in section 3) or also to the reanalyses, even though they provide separate snowfall and rainfall?

p12, line 31

Even a model that could account for impurities would not do so in this case because dust deposition was not provided as an input.

p18, line 33

MeteoIO errors are relatively small for temperature and snowfall, but errors in other forcing variables are not shown.

Correct spelling of "systematically" throughout

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-511, 2019.