Geoscientific
Model Development
Discussions

Interactive comment on "Reinitialised versus continuous regional climate simulations using ALARO-0 coupled to the land surface model SURFEX" *by* Julie Berckmans et al.

Anonymous Referee #2

Received and published: 7 September 2016

The manuscript has two questions in mind: (1) Is the land surface model SURFEX better than ISBA in climate application with the modelling system ALADIN in ALARO-0 set-up? (2) Is it better to do regional climate simulations or dynamical downscaling (i.e. with re-initialization of the regional atmosphere and land surface) or some mix (e.g., continuous land surface simulation with atmosphere and sea surface temperature re-initialization)? In my opinion these questions are only weakly linked. Of course, if you want to apply continuous land surface simulation there is need to use the best available land surface model (a bad land surface model might render a regional climate simulation useless), but a better land surface model is better even in an NWP context. Therefore, I suggest to focus on one of the questions and I find the second question

more interesting.

The manuscript claims that SURFEX is better than ISBA. It has been shown in NWP context (given reference Hamdi et al., 2014), but the authors target climate time scales. They compare an available CORDEX simulation with ISBA against a new climate simulation with SURFEX which was done using a smaller simulation domain. Different domain sizes limit the comparability crucially. Both simulations were driven by the re-analysis ERA-Interim. Therefore, I would expect limited-area simulations are potentially better with a smaller domain. The presented results are not conclusive.

The authors cite many re-initialization vs regional climate simulation experiments. Even with ALADIN such a re-initialization experiment has been published, but for a 3-monthly period only (Beck et al. 2004). I suggest to make the manuscript more interesting and publishable by doing the list of re-initialization experiments more exhaustive by adding (a) full re-initialization (i.e. with SURFEX re-initialization) and (b) blending (i.e. re-initialization of the large atmospheric scales doing "climate" for the smaller scales, see Beck et al. 2004). Finally, perhaps too much for one paper, I think the ultimate criterium will be how the set-up performs with GCM forcing.

Beck, A., Ahrens, B., and Stadlbacher, K. (2004). Impact of nesting strategies in dynamical downscaling of reanalysis data. Geophysical Research Letters, 31, pp. 5. doi:10.1029/2004GL020115