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Geoscientific
Model Development
Discussions

Interactive comment on "The SURFEXv7.2 land and ocean surface platform for coupled or offline simulation of Earth surface variables and fluxes" *by* V. Masson et al.

Anonymous Referee #1

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The article presents a description of SURFEX and describes the key features and it definitely merits publication in this journal. Please see my specific comments and suggestions below:

1. The article could be improved by providing a "big picture" vision behind SURFEX. It definitely has a lot of bells and whistles. The vision of SURFEX is to be a hydrometeorological platform or more of a global modeling platform or both? Is it supposed to cut across both NWP research and applications? Some of these are scattered throughout the document. It would help to describe them right at the top before getting into the nitty gritty of the models.

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2. It would also help to provide a review of similar efforts at other organizations. There are land data assimilation systems (LDAS), Land Information System (LIS) from NASA, High Resolution LDAS from National Center for Atmospheric Research, efforts at Environment Canada, etc. There has been a lot of work done with GLDAS, NLDAS efforts. Weather Research and Forecasting (WRF) model is another relevant effort to compare (depending on how the authors view SURFEX).

3. I suggest that a schematic figure describing the SURFEX structure and its key pieces be included (ISBA, TEB, DA, hydrology, dust etc.). The authors do not have any mention of the software architecture behind it and if any thought has been put into designing the system. Does SURFEX include any notion of interoperability and extensibility? How easy is to include various components?

4. SURFEX seems like a big, complex system, especially with the addition of data assimilation and coupling interfaces. Can the authors provide some estimates of the computational requirements and how they are addressed in SURFEX?

5. The abstract could be improved. The sentence "It can be run in either coupled or offline mode" is repeated. Rather than describe an outline of the paper (which is how the abstract now sounds like), it should describe what SURFEX is and its key capabilities and its vision.

6. NOAH is not an acronym. It should be written as "Noah"

7. Section 2: "SURFEX uses the widespread tiles approach" – I would avoid such descriptions. Please be specific and provide the correct reference.

8. Section 3: Is SURFEX limited to a particular set of datasets? How flexible is it to plug another dataset?

9. Section 4.1 "...while minimizing the input parameters and optimizing the speed.." – is it supposed to say "optimizing the input parameters and minimizing the speed.." ?

10. Section 4.1.1 " .. the usual aerodynamic .." - please be specific.

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5, C1411–C1413, 2013

Interactive Comment

11. The description of the ISBA/TEB modules and parameterizations are quite extensive. Since most of this stuff has already been published, the authors could condence these sections to be more succint.

12. Section 7.2 : There is a mention of CDF matching for bias correction in the context of ASCAT assimilation. The issue of addressing biases is in fact a larger data assimilation problem and it would be helpful to address it in this section.

13.The perspectives section could describe what are some of the limitations of the system.

14.Figure 5: Can you quantify the information in these two maps (average skill for e.g.), either in text or in the figure itself?

15.Figure 7: It is pretty obvious, but which figure corresponds to what?

16.Figure 8: Are the improvements shown in the curves statistically significant?

Interactive comment on Geosci. Model Dev. Discuss., 5, 3771, 2012.