

## ***Interactive comment on “The Interactions between Soil-Biosphere-Atmosphere (ISBA) land surface model Multi-Energy Balance (MEB) option in SURFEX – Part 1: Model description” by Aaron Boone et al.***

**Anonymous Referee #1**

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This paper described an improved version of ISBA for better representation of the land surface processes. I found this paper to be well organized and written and also valuable for the land surface modeling community. Therefore, I propose minor revisions before accepting the paper for publication.

I propose a small change in title “The Interactions between Soil-Biosphere-Atmosphere land surface model with Multi-Energy Balance option (ISBA-MEB) in SURFEX”

P3. L. 63-69: Re-phrase the paragraph describing the different application of ISBA. Possibly break the sentence to multiple sentences each describing one of the ISBA

C1

application. For example “ISBA has been used in operational high resolution short term numerical weather prediction . . . . . It also has been employed in climate research studies . . . . .”

P3. L75: Remove this phrase “by improved realism with respect to for example” then rephrase to “The force-Restore approach of ISBA has been replaced in recent years by multi layer explicit . . . . .”

p3. L90: The last sentence is unfinished!

P4. L93: change “lessening” to reducing or minimizing.

P5. L.130-135: Needs some correction in the text. For example: put parenthesis around “Smith et al. (2011)” and “Zhang et al. (2014)”. “over Europe by Wramneby . . . . .”

P6. L.171: by DIF do you mean ISBA-DF in Boone et al. 2000? what ES stands for? Line 4: is it 12 soil layers? what is the total depth of the soil?

P6. L.188: Define Va

P6. L. 189-191: Re-phrase “ equations for the evolutions o the bulk vegetation canopy temperature, Tv, the snow-free ground surface (soil-litter) temperature, Tg, . . . . .”

P6. L. 192: change to “equivalent water content of ice” or “ice water equivalent (IWE)”

Fig 1: the colors in the picture is not as indicated in the text.

P8. L 233: should be Eq. 5

P8. L225-227: Define other parameters in Eqs 4-6 (e.g. H, LE, Rn, G, SW) with their units.

P11. L354. Shouldn't be qsatin based on eqs 19, 20?

P16. L490. Are emissivities defined based on the vegetation classes?

C2

P20 L. 637: Correction “soil liquid water content and water content equivalent of frozen water”

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