Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2020-416

Anonymous Referee #1

Referee comment on "STEMMUS-UEB v1.0.0: integrated modeling of snowpack and soil water and energy transfer with three complexity levels of soil physical processes" by Lianyu Yu et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2020-416-RC1, 2021

Interactive comment on “STEMMUS-UEB v1.0.0: Integrated Modelling of Snowpack and Soil Mass and Energy Transfer with Three Levels of Soil Physical Process Complexities” by Lianyu Yu.

This manuscript aims to incorporate the snowpack effect into a STEMMUS-FT modeling framework, with various complexities of mass and energy transfer physics, then investigate the effect of snowpack on soil moisture and heat transfer. In general, the manuscript is well written and interesting to me. I recommend a major revision for this manuscript before its acceptance for publication.

General comments:

- There are too many long sentences which make them hard to follow.
- Can the simulated time series of daily average albedo and LE (latent heat flux) be longer?
- The freezing and melting processes are a cyclic process, it will be more reasonable to describe the two processes together (section3.4.1 & 3.4.2).
- The language could be polished in various places in order to facilitate understanding.

Specific comments:

- The overview of the coupled STEMMUS-FT and UEB model framework and model structure in figure 1, the text is too small to read.

- Figure 6 is too long, which can be divided into three figures or rearranged. Time series of different variables overlapped and changes in different variables are not visible. Such as q_{Lh} and q_{LT}. Same as other figures.
- In Figure 7 (e, f, h, i), the sharp changes should be explained on Day 103. The figure and legend are overlapped.