Response to the Editor

Comment # 1.1

Dear authors,
Thank you for your submission to GMD and thank you for your patience with us. Since this manuscript was submitted in preprint form from another source I didn't want to delay the review process further, but should the paper be accepted for final publication in GMD, there are a few editorial rules to follow:

Reply:

We thank the editor, Fabien Maussion, for his time, helpful feedback, and an expedited yet thorough review process.

Comment # 1.2

Name the model version and name in the paper. I think your contribution falls into this category:
If the model development relates to a single model then the model name and the version number must be included in the title of the paper. If the main intention of an article is to make a general (i.e. model independent) statement about the usefulness of a new development, but the usefulness is shown with the help of one specific model, the model name and version number must be stated in the title. The title could have a form such as, "Title outlining amazing generic advance: a case study with Model XXX (version Y)".
Source: https://www.geoscientific-model-development.net/about/manuscript4_types.html#item2

Reply:

Here we would like to respectfully decline this suggestion and request to keep the current title. Our contribution presents a novel data assimilation scheme, namely AdaPBS, and its application to cryospheric problems with a focus on seasonal snow. As such, the manuscript is about a widely applicable method and not a single model. In particular, we test AdaPBS using *two* different models: a temperature index model in Experiment 1 and an intermediate complexity snow model [FSM2; Essery et al., 2025] with a full energy balance in Experiment 2. In concurrent work, we have also shown how AdaPBS can be applied to coupled snow-permafrost data assimilation with CryoGrid [Willmes et al., 2025] and for calibrating global glacier models in the form of PyGEM-OGGM [Yang et al., 2025]. While the experiments herein were

enabled and executed within the MuSA snow data assimilation toolbox [Alonso-González et al., 2022], already published in GMD, AdaPBS is a standalone and toolbox-agnostic methodological advancement. The public release of our code [Alonso-González and Aalstad, 2025, Alonso González and Aalstad, 2026] is intended to make it straightforward for other researchers to apply and remix AdaPBS across various cryospheric data assimilation problems and beyond. Therefore, we believe a general title is the most accurate representation of this work and is in line with GMD guidelines for *Development and technical papers*.

COMMENT # 1.3

> *Furthermore, GMD's code and data policy not only requires the tool or model's code to be shared (which you have), but also the scripts, data and configuration files which have been used to generate the paper's figures and tables (https://www.geoscientific-model-development.net/policies/code_and_data_policy.html). Unless I'm mistaken, this code was not part of the data availability section. Could you please reply to this comment with a link and DOI to a separate repository sharing the analysis scripts?*

Reply:

We thank the editor for pointing out this omission, we had indeed shared the updated MuSA code including the new AdaPBS through Alonso-González and Aalstad [2025] but not all the specific code and input data needed to run the experiments in the paper. We have now also added the relevant code and data to ensure reproducibility through Alonso González and Aalstad [2026] and updated the *Code and Data availability* section accordingly.

We thank the editor again for his time and effort in handling our manuscript.
On behalf of all coauthors,
Kristoffer Aalstad and Esteban Alonso-González

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