

Dear Dr. Birgit Heim,

Thank you very much for handling our manuscript (MS No. ESSD-2025-728). We greatly appreciate your positive evaluation and your decision to invite a minor revision. We have carefully revised the manuscript according to your comments and are pleased to submit the revised version for your consideration for publication in *Earth System Science Data*.

In the revised manuscript, we have incorporated the time frame of our products into the title as requested. We have also enhanced the readability of Figure 2 by optimizing the color scheme and line thickness of the legend boxes at the base of the figure, and have clarified the figure caption accordingly. Furthermore, we have spelled out abbreviations in all table and figure captions to improve clarity for readers. Finally, to better guide users, all content previously located in the supplementary document has been integrated directly into the main manuscript as an appendix.

Please find attached the revised manuscript and our point-by-point responses to your comments. For clarity, all responses in the response letter are highlighted in **blue**, while changes within the revised manuscript are highlighted in **red**. We hope that this new version meets with your approval.

We greatly appreciate your time and efforts in reviewing our work, and we look forward to hearing from you.

Sincerely,

Xiaojun Li

on behalf of all co-authors

## Point-by-point responses to the editor' comments

Dear authors and referees,

we would like to thank you for your supporting reviews of the satellite-based ‘operational global L-band soil moisture and vegetation optical depth dataset from optimized 40° SMOS brightness temperatures’ manuscript and time series datasets and the authors for your replies to the reviews and the edited manuscript and dataset. The reviewers highlight that this new product serves the research communities well and the product details and production and assessments are well described in the manuscript.

We are pleased to accept your dataset and manuscript for final publication in ESSD considering minor revisions by the editor.

**Response:** We sincerely thank the editor and the reviewers for the careful reading of our manuscript and for the encouraging feedback. We are pleased that our work is accepted for publication in ESSD considering minor revisions. We have fully addressed the specific comments raised by the editor in the revised manuscript, as detailed point-by-point below. We hope the revised manuscript now meets all the requirements for final publication.

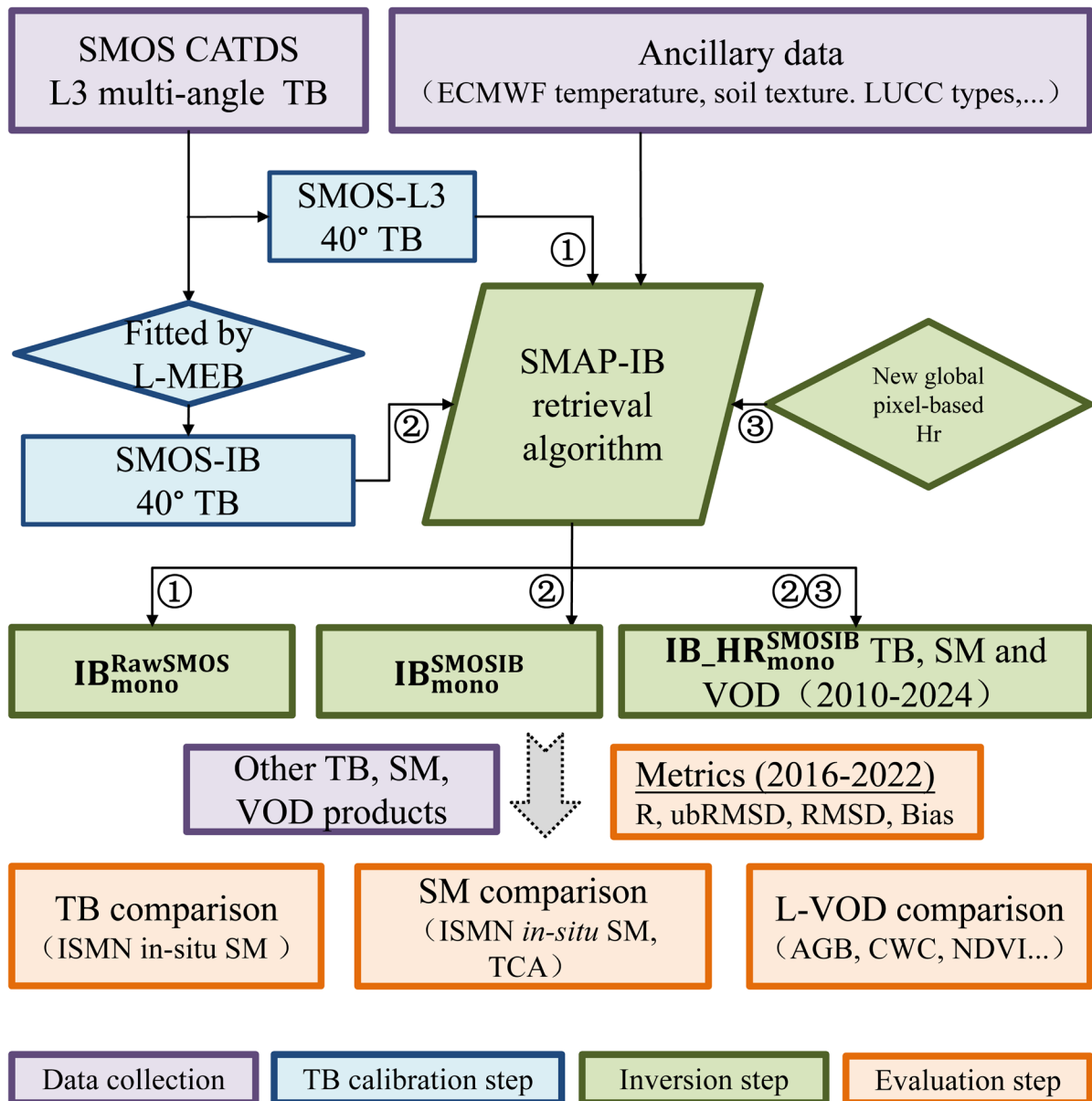
1. Please undertake one minor change related to the title of your ESSD publication by including the time frame of your products (years) into the title.

**Response:** We thank the editor for this suggestion. We have added the time frame to the title as requested. The updated title is as follows:

*“An operational global L-band soil moisture and vegetation optical depth dataset from optimized 40° SMOS brightness temperatures for 2010–2024”*

2. Please consider optimizing the color scheme of Figure 2 and the figure captions by choosing stronger colors / thicker lines around the boxes at the base of the figure – described in the figure caption as green, yellow,... as it is not so clearly visible in the figure, please also specific in the figure caption that the color refers to box outlines.

**Response:** We fully agree with the editor's suggestion that using stronger colors and thicker lines for the box outlines at the base of the figure, and explicitly stating in the caption that the colors refer to these outlines, significantly improves the figure's readability. We have updated Figure 2 and its caption in the revised manuscript accordingly as follows:



**Figure 2: Flow chart illustrating the workflow from data production and performance assessment of ① $IB_{mono}^{RawSMOS}$ , ② $IB_{mono}^{SMOSIB}$  and ③ $IB_{HR_{mono}^{SMOSIB}}$ : inputs (purple box outlines), SMOS-IB TB calibration (blue box outlines), SM (soil moisture) and VOD (vegetation optical depth) inversion (green box outlines) and performance assessment (orange box outlines).**

3. In general, can you spell out abbreviations in table and figure captions as there are many occurring in the figure captions and this is not easy to read.

**Response:** We thank the editor for this helpful suggestion. We have spelled out all abbreviations in the table and figure captions in the revised manuscript to improve readability.

4. I would also recommend to put all the content of your supplement document directly in the manuscript as appendix, so these are not two separate documents and the readers can access all useful explanations, data visualizations and table of abbreviations directly in the manuscript.

**Response:** We fully agree with the editor's suggestion that including the supplementary content directly in the manuscript as an appendix will better guide readers. We have therefore moved all content from the supplementary document to an appendix in the revised manuscript.