

Response to Reviews of "Assimilation of snow water equivalent from AMSR2 and IMS satellite data utilizing the local ensemble transform Kalman filter" by Joonlee lee, Myong-In Lee, Sunlae Tak, Eunkyo Seo, and Yong-Keun Lee. (Geoscientific Model Development: #gmd-2023-221)

We would like to thank the reviewers for their valuable feedback. Their insightful comments helped improve the quality of this paper. After examining the reviewers' comments, we have corrected and modified our manuscript. Our responses to the individual comments are provided below in blue.

Reply to the Reviewer (#1)'s Comments:

As this paper has undergone several review iterations and it appears that the authors have implemented the revisions suggested by previous reviewers, I will keep my review brief and limited to the following minor comments and suggestions:

Line 27: "... owing to its enduring memory...". Since "memory" has not yet been defined as intended by the authors up to the third line in the abstract, I suggest revising the wording.

Response) In response to the reviewer's suggestion, we have replaced the term "memory" with "persistence."

Revision) (L25-28) Snow Water Equivalent (SWE), as one of the land initial or boundary conditions, plays a crucial role in global or regional energy and water balance, thereby exerting a considerable impact on seasonal and sub-seasonal scale predictions owing to its enduring persistence over 1 to 2 months.

Line 327: Typo "gird point" should be corrected.

Response) Modified as suggested.

Line 357: Revise the sentence to "differences from IMS for AMSR2, Openloop,..." to be consistent with the figure caption.

Response) Modified as suggested.

Line 358: Clarify if SCF and SWE are being used interchangeably (Figure 2 displays SCF).
Response) Figure 2 represents the SCF from JRA-55. We have corrected the typographical error in the sentence by replacing "SWE" with "SCF."

Revision) (L358-360) Here, the JRA55 SCF serves as a reference dataset for comparison with other reanalyses and is associated with meteorological forcing data used in the JULES land surface model.

Figures: Add color-scale labels (with parameter and its unit) in the figures.

Response) We have added the color-scale labels' units to the captions of each figure, as requested. SWE is measured in units of kg/m^2 or mm, while Spearman rank correlation is dimensionless. Like the correlation, SCF is also dimensionless since it represents a proportion rather than a physical measurement with units.

Figure captions 2, 3, 4, 5, 6, 7, 10 (and other instances in the paper and in the SI): The statement "Negative values in red shades are indicated with a diagonal line" is unclear as the diagonal lines are not visible. Please clarify their purpose.

Response) To ensure clarity for readers with color vision deficiencies, hatching has been applied to indicate negative values. Specifically, we have revised Figures 2, 3, 4, 7, 9, 10, and SFig. 3 to distinguish between positive and negative values accordingly.