Author's Responses to the comments on *"Brief communication: Improving ERA5-Land soil temperature in permafrost regions using an optimized multi-layer snow scheme"*

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The authors would like to thank the editor for the thorough assessment of the manuscript. Below we provide a point-to-point response to each comment, editor comments are given in black, responses are given in blue. Additionally, we have included details of how we addressed these changes in the revised submission.

- Line 6: change to "...across the 522 observing stations..."
  Response: revised

- Line 119: change to "...and the period 1979–2000 was used..."
  Response: revised

- Line 124: double check the number of stations provided here compared to the abstract?
  Response: There are 639 stations used in total, among which 522 station are in high-latitudes (as described in the abstract), the others are from high-altitudes.

- Line 126: "The snow performance was evaluated via snow depth at sites where observations are available." Can you specify the number of sites?
  Response: revised as *"...at 173 sites..."*

- Line 149: suggest removing "remarkable"
  Response: removed

- Line 171: change to "...which does not allow..."
  Response: Revised

- Figure 2 caption: change "ERAL" to "ERA5L" in the third line
  Response: Revised

- Thank you for adding the additional information in Figure 2, and the illustrative time series in the supplement. I would like to see a short paragraph added to the supplement which explains the figure. This can be very brief, but would help ensure there is full value to the supplement.
  Response: We added below paragraph to clarify.

  Text S1
  Figure S1 showed the comparisons of observed snow depth and soil temperatures time-series with simulations at selected sites from different geographic regions. The results indicate the snow depth overestimation was reduced in Exp. MLS-Dis+Den with multi-layer snow scheme, and leads to a better representation of soil temperatures with lower bias compared to ERA5-Land.