Dear Editor,

We thank you for the careful evaluation of our revised manuscript and for the constructive comments regarding the methodological framing of the use of Monin–Obukhov Similarity Theory (MOST). We appreciate the positive assessment that the revised section already improved the clarification of our assumptions. Following your recommendations, we have further revised the manuscript to make the interpretation and limitations of our results clearer and more internally consistent. Our responses to the specific points are provided below.

The manuscript has been revised to state more clearly that MOST is used as a pragmatic closure for parameterizing surface–atmosphere exchange rather than as a physically rigorous turbulence formulation at the scale of individual soil patches. The Methods section now explicitly states that the assumptions underlying MOST, in particular horizontal homogeneity of the surface layer, are not strictly fulfilled at the decimeter scale represented in DynSoM-2D. MOST is therefore not interpreted as a physically valid description of patch-scale turbulence, but is employed as an approximate closure under a shared atmospheric reference state.

We clarified the interpretation of the turbulent fluxes calculated for individual soil patches. The revised text now explicitly states that these fluxes should not be interpreted as physically resolved local turbulent fluxes above each patch. Instead, they represent diagnostic contributions to the area-averaged surface flux that arise from differences in surface temperature and soil moisture states while all patches interact with identical atmospheric conditions at the reference height.

We carefully checked our justification of using MOST and found the specific “only 1D” formulation being only part of our first reviewers’ reply. Our revised text emphasizes the idealized modeling framework and the use of shared atmospheric reference conditions, which is consistent with common tile-based land surface modeling approaches.

A limitation statement has been added in the Discussion section to clarify the scope of the results. The manuscript now explicitly notes that the modeling framework represents a highly idealized configuration and that the results should be interpreted as an idealized representation of how subgrid soil heterogeneity may influence surface energy partitioning, rather than as a physically resolved description of patch-scale turbulent transport.

We carefully reviewed the entire manuscript to ensure that no remaining passages imply that MOST is physically valid independently over each individual soil patch. The wording has been adjusted where necessary to maintain consistency with the clarified methodological interpretation.

As suggested, we have thoroughly edited the entire manuscript again for clarity, grammar, and formatting. Typographical errors, duplicated words, and spacing issues have been corrected, and the sentence structure has been improved to enhance readability. If there are still errors that we have overseen, we are more than happy to correct them as well.

We thank you again for these helpful suggestions, which have significantly improved the clarity of the methodological description in the manuscript and the interpretability of our results.