Dear Editor and reviewers,

We have edited the manuscript taking into account that minor revisions were expected and that the first reviewer was amenable to accept the last submission of the manuscript "as is". The second reviewer asked for minor revisions which we have addressed, by modifying figures 8, 11 and 10, modifying the abstract and clarifying the conclusions of section 5.4. Since their presentation quality score had a lower value we have, additionally, reviewed the English within the text. We thank the reviewers and the Editor for their work and assistance in helping us improve the manuscript.

Yours faithfully,
Belén

Reviewer 2
The authors have carefully addressed all comments raised in the first review round. The revisions are extensive and have clearly improved the scientific clarity, methodological transparency, and overall readability of the manuscript. However, I recommend minor adjustments to further improve clarity and strengthen the manuscript's presentation and scientific message.

The abstract still contains more background and methodological detail than necessary. A more concise abstract focusing on the core scientific question, the essential methodological approach, and the key findings would improve readability and better direct the reader's attention to the main contribution of the work.
Thank you for your suggestions. We have removed several introductory sentences and reworked some others to better emphasize the results. The abstract now reads as follows:

"Estimating latent heat fluxes in semi-arid environments remains challenging due to the strong spatial heterogeneity of soils and plants, land management practices, and limited observational data. In particular, accurately predicting the partition of evapotranspiration into evaporation and transpiration from observations remains very challenging. Land surface models (LSMs) can be used as a tool in this regard, when their validation is possible, but recent studies have indicated that LSMs generally overestimate soil evaporation.
This study evaluates the performance of the land surface model ISBA within the SURFEX platform using data from two contrasting sites during the Land surface Interactions with the Atmosphere over the Iberian Semi-arid Environment (LIAISE) field experiment: an alfalfa field subjected to flood irrigation, and a natural grassland which is nearly senescent during the study period. It was found that the ISBA model tended to overestimate the evapotranspiration. Therefore, a dry surface layer (DSL) resistance was implemented in the ISBA model to improve the simulation of evaporation, which has proved successful in other models. The implementation of a DSL resistance led to an improvement in the simulated latent heat flux by reducing bare soil evaporation compared to simulations without a soil resistance. This approach reduced the daily RMSE of the latent heat flux by 29% and 32% at the alfalfa and natural grass sites, respectively, while marginally increasing the correlation at both sites. Sensible heat flux and net radiation have improved on the order of 10 $W\ m^{-2}$, whereas the ground heat flux has deteriorated within the same order. The resulting DSL simulations reduced the overall global error compared to a simulation without a DSL resistance. A sensitivity test of the parameters that drive a DSL resistance in ISBA further improved the simulations, reducing excessive diminution of LE after rain events. The new DSL parameterization helps overcome current problems of ET modeling by reducing bare soil evaporation within LSMs."

In Section 5.4, the sensitivity analysis is well designed, but its interpretation would benefit from a clearer synthesis. It would be helpful if the authors could explicitly summarize what parameter combination performs best and what physical implications these optimal parameters carry regarding the dry surface layer resistance. Additionally, clarifying the potential generalizability and limitations of the proposed parameterization, particularly whether it is likely to apply to other semi-arid environments or different soil/vegetation configurations, would strengthen the practical relevance of this section.

We have modified the last paragraph of Section 5.4, in order to clarify which parameter has been found to work best, which are the limitations on a larger scale context and the limitations of current development of the resistance framework.

"The correlation values of LE for the different values of Kdsl and zdsl are shown in Fig. 13. The correlation for La Cendrosa is improved over the S92 simulation (daytime in Table 3) and for Els Plans it is equal to or slightly better than the NON simulation (daytime in Table 4). This implies that the optimal values for improving LE are zdsl = 0.01 and Kdsl = 0.85. They have a greater resistance than S92 but less than that found in Swenson and Lawrence (2014), for the two sites and specific conditions considered in the current study. At a larger scale, this difference in parameters to Swenson and Lawrence (2014) global runs would imply a smaller resistance generally, except for the development of the resistance, which starts at slightly higher soil water contents. Improvement of LE estimation is expected with the application of the DSL resistance at a larger scale. Zhang and Wang (2017) showed that while there are differences between soil types, a resistance exists and it should prove an improvement in other semi-arid sites. Further refinement on these parameters is still possible with larger sampling, particularly in the form of zdsl which presents a linear dependence at this point. Nevertheless, the testing shows that these parameters are quite robust in their impact over LE. The interactions of a soil resistance with different kinds of vegetation have not been been a point of study, largely studied due to technical difficulties: laboratory setup studies would need too many samples and time for the soil to stabilize and studies would tend to use more complex models, in situ meteorological stations do not have systematically the soil characteristics to verify the results. Furthermore, the application of the soil resistance will result in minimal improvement in locations with a very high vegetation transpiration to evaporation ratio contribution."

Several figures would benefit from improved visual clarity. For example, in Figure 10, different simulations are represented by solid and dashed lines that are difficult to distinguish, especially when curves overlap. Adding distinctive marker symbols (e.g., triangles, squares, circles) on the lines and enhancing color contrast would make the figure more accessible to readers. More generally, adopting a more coherent and visually appealing color palette throughout the manuscript would further improve figure quality."

We have updated figures 10, 11 (see below) using symbols and more distinctive colors to make them more visible and figure 8 now uses the same colors as figures 6 and 7. We have maintained the rest of the figures as they were since the palette had already been chosen for large contrast between elements.

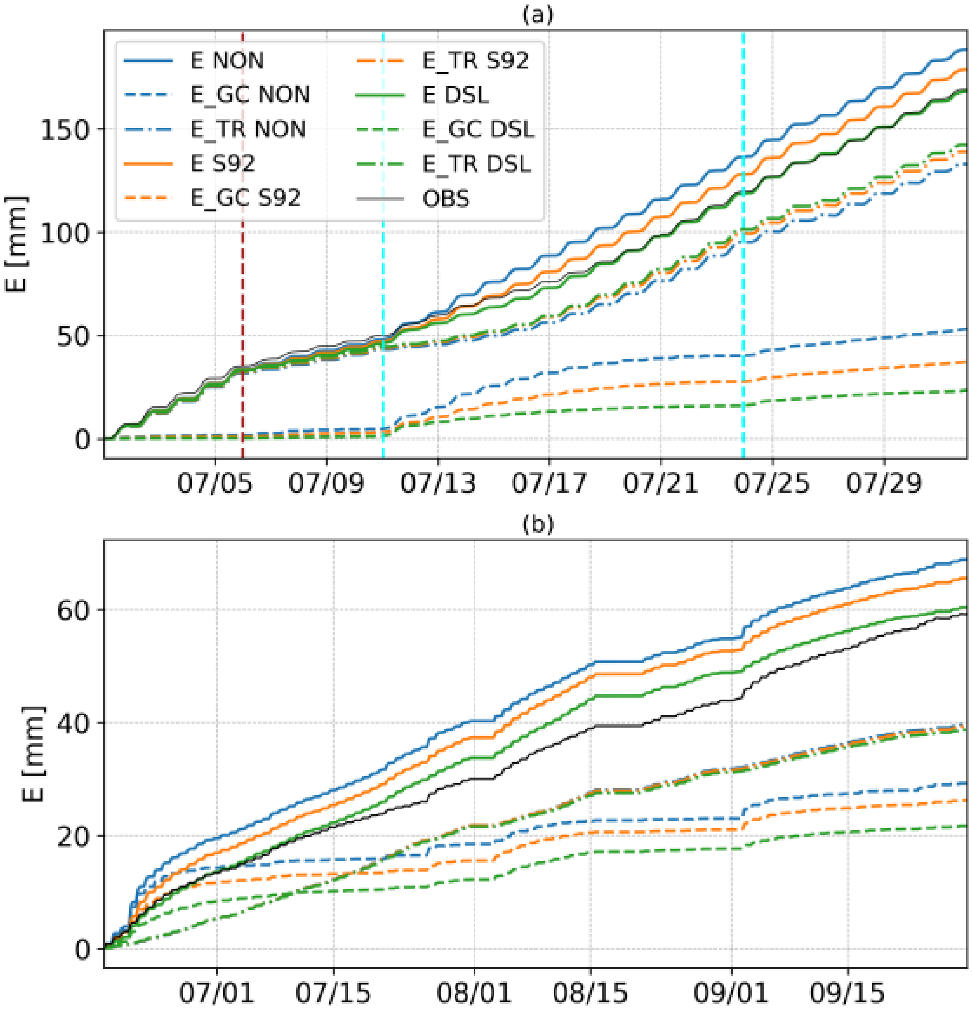

Figure 8. Accumulated latent heat flux (E) for La Cendrosa (a) and Els Plans sites (b). Observations are in black, simulations with no resistance are in blue, with Sellers 92 in orange and a DSL resistance in green. Solid lines correspond to the E, dashed lines correspond to the ground evaporation and dashed and dotted lines correspond to the transpiration contribution. The vertical brown line corresponds to the harvest, and cyan lines correspond to irrigation events.

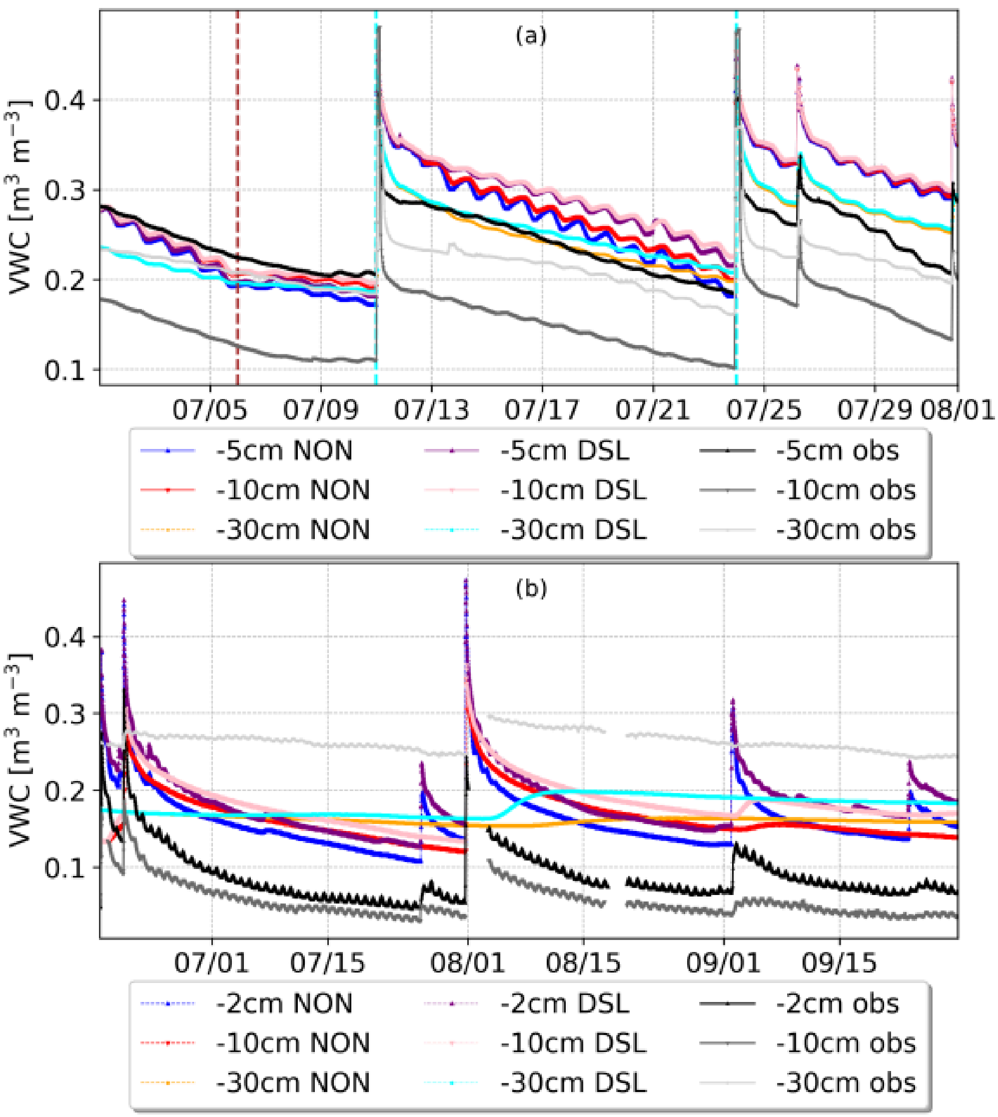

Figure 10. Volumetric water content (VWC) of the soil at La Cendrosa site (a) and Els Plans (b) sites at different depths. Levels comprise 2 or 5 (upward triangles) depending on the availability for the site, 10 (downward triangles) and 30 cm (circles). Respectively, observed VWC is shown in black, dark grey and light grey lines, the NON simulation in dark blue, red and orange dashed lines and the DSL simulation in purple, pink and cyan dotted lines.

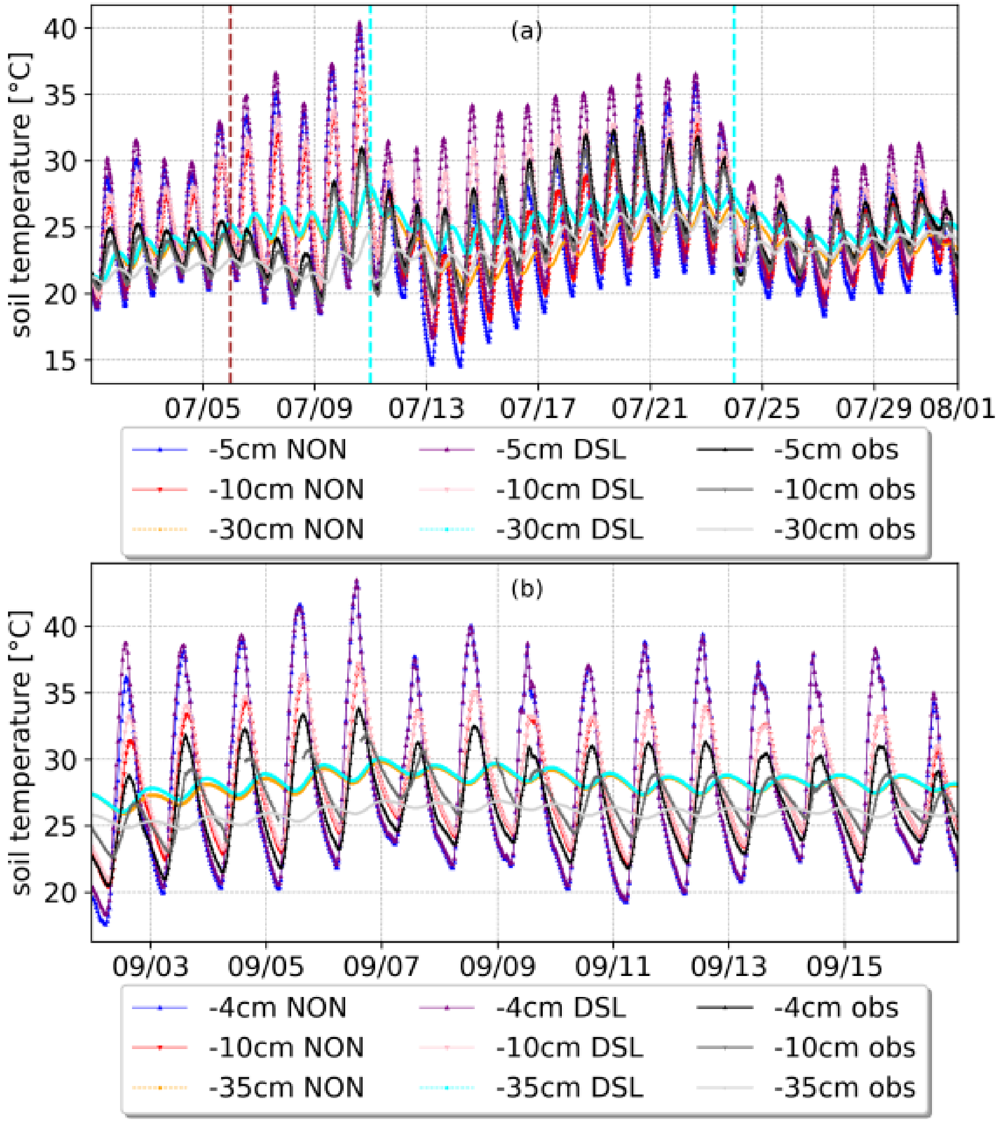

Figure 11. Soil temperature at La Cendrosa site (a) and Els Plans (b). Levels comprise at 4 or 5 (upward triangles), 10 (downward triangles), 30 or 35 cm (circles) depending on the availability for the site. Respectively, observed VWC is shown in black, dark grey and light grey lines, the NON simulation in dark blue, red and orange dashed lines and the DSL simulation in purple, pink and cyan dotted lines.