

Review of the manuscript entitled “Implementation of a dry surface layer soil resistance in two contrasting semiarid sites with SURFEX-ISBA V9.0” by Belen Marti et al. This manuscript develops a new dry surface layer (DSL) resistance for the ISBA LSM to simulate more realistically evapotranspiration processes in rural areas. Two observational sites located in the north-eastern of Spain are used to validate the performance of the model. Three simulations (offline) are performed with the LSM in each site, one run does not use a soil resistance parameterization (hereafter NON simulation), one experiment uses the DSL approach (henceforward DSL simulation), and finally, the third simulation considers the soil resistance parameterization developed by Sellers et al. (1992b and 1996), hereafter S92 simulation. Modeled sensible, latent, and net radiative heat fluxes are compared against observations and common statistical errors are calculated for each experiment and site. This manuscript is interesting but considerable changes are needed before it can be accepted for publication.

1. Abstract, line 4. Before “models” add “land surface”.
2. Page 3, line 75. “Both parametrizations are tested”, what parametrizations? The only parametrization described until now is the dry surface layer (DSL).
3. Section 2 should be reduced considerably. If you think all equations are important add them in an appendix or as a supplementary document.
4. Section 3.1. All the observational data collected in both sites and used for validating the simulations should be clearly explained.
5. Section 3.2. How were the SEB terms calculated/observed, especially the ground heat flux (G)? In general, the ground heat flux is calculated as the residual term of the SEB equation, that is,  $G = R_n - H - LE$ . However, in this study/experiment is not the case. Please, clarify.
6. Section 3.3, line 288. The fact that the albedo is lower in El Plans than in La Cendrosa cannot explain the lower value for the  $R_n$ . Low albedos increase net radiative heat fluxes.
7. Section 4.1, line 305. “The wind speed was filled with the 3 m data at the same site”, It is the first time that observations are reported at this height in the manuscript. Was the wind speed recorded at 10 m or 3 m above ground? or at both heights?
8. Section 4.2.1. Is this large section needed? A summary with a table showing the values used in the runs should be sufficient. Results section starts at page 17!!!

9. Section 5.1. Why do you think the ground heat flux is not improved with the new dry surface layer approach? How is this term calculated in the LSM?
10. Section 5.1, line 476. I was not able to find in Table 6 the daily RMSE reported for the ground heat flux in the manuscript (i.e.,  $57 \text{ W/m}^2$ ).
11. Figs 4-5. The period analyzed in these figures should be included in the captions.
12. Figs. 6, 7, and 8. The format of the days simulated (DD/MM) is not adequate.
13. Fig. 7b. Why does Fig. 7b show results for three months and Fig. 6b only shows results for 15 days for the Els Plans site?
14. Section 5.2.1. The resistance values shown in Fig. 7 are very different between S92 and DSL simulations, why do you think these significant differences are not producing substantial latent heat fluxes disparities?
15. Section 5.3.1. Is this section needed?
16. Section 5.3.2, Fig. 10a. It seems to me (based on Fig. 10a) that the VWC is better captured by the NON simulation than by the DSL run, especially after the  $\sim 11^{\text{th}}$  and before the  $\sim 24^{\text{th}}$  of July, could you explain why?
17. Section 5.3.2, Fig. 10. The format of the days simulated (DD/MM) is not adequate.
18. Section 5.3.2, Fig. 10b. Again, the VWC seems better simulated by the NON experiment than by the DSL simulation, could you explain why?
19. Section 5.3.3. Fig. 11a shows that the NON simulation reproduces considerably better the maximum soil temperature at 5 cm (below the ground surface) than the DSL simulation for an approximately a 10-day period in the middle of the month (July), could you explain why? Also, the DD/MM format is not adequate here.
20. Section 5.4, line 661. How were the RMSE values of 4 and  $2 \text{ W m}^{-2}$  reported here calculated?