

## ***Interactive comment on “Thermal signal propagation in soils in Romania: conductive and non-conductive processes” by C. Demetrescu et al.***

**C. Demetrescu et al.**

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### A. Technical corrections

1. We observed all language corrections suggested by Referee #1 and Referee #2.  
2. We observed all corections sugessted for Figs. 1, 3. In case of Figs 8 and 9, K was kept in the ordinate, as these figures show temperature differences from the average temperature of a certain day, not temperature values. 3. We observed the suggestion regarding axes labels, using actual dates. 4. We thank Referee #1 for additional references he brought to our attention. As a matter of fact it was not our intention to make a comprehensive review of the literature and perhaps it would have been better to use “Đe.g.” before some of the citations. However, we included the

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references suggested.

## B. Specific comments

1. We removed Section 3 from the paper.

2. Figures 8 and 9 (5 and 6 in the revised manuscript): - Reviewer #1 is right in his explanation on the lack of sensitivity of the 5cm soil model to the chosen thermal diffusivity value. Accordingly, a short explanation was added in the revised text. - The diffusivity results from the slope of the plots in Fig. 9 (one value for the 0-100 cm depth interval). The method used is not designed to derive diffusivity values for each depth interval. On the other hand, the value of 0.4 ( ) used in modeling is close to 0.49 or 0.42 of Table 2. We added a corresponding comment in the revised manuscript. - The differences between modeled and observed temperatures during the cold season (Fig. 8) are not entirely a snow cover effect: as discussed in the last section, the release of latent heat during water freezing in the soil layer considered happens also in the presence of snow, of course with a smaller amplitude of postfreezing temperatures than in the absence of snow. We pointed out in the revised manuscript that the air-soil coupling changes induced by the snow cover is superimposed on latent heat effects. See also our comment (4) regarding Figs. 14 and 15.

3. Figures 9 and 10. (6 and 7 in the revised manuscript). The separation really coincide with the onset of increased precipitation. The referee is right in that we should investigate this further, but this could be a matter for another report.

4. Figures 14 and 15 (11 and 12 in the revised manuscript) Referee #1 is right: we treated two problems under one "banner", namely conductive versus non-conductive processes. Actually we can not properly discuss separately, in a quantitative manner, the coupling between the air and the ground, because, as we mentioned in the "Data" section, there were problems related to the definition of GST in the measuring system, which have not been clarified yet, and we could not use the corresponding data set in the present paper.

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