

Interactive comment on “Identification of soil-cooling rains in southern France from soil temperature and soil moisture observations” by S. Zhang et al.

Anonymous Referee #3

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General comment: This paper presents an assessment of soil-cooling rain events in South of France and is based on observations recorded during 9 years, a long enough period to allow robust statistics. The paper is mostly a description of the dataset which is stratified in different ways. The dataset and the method are generally well described and the argument is quite relevant. The modelling aspects are less satisfactory, for instance, the comparison between ISBA and the observations is not convincing since ISBA does not represent the cooling process and the quality of the forcing is poor (duration and intensity of the rain events). On one hand the discussion of the results could have been shortened by summarizing some of them in tables, on the other hand insights to understand when, where and why soil cooling occurs or not would

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have been valuable to help model development. For instance section 5.2 starts well "Does soil cooling matter" but at the end of the section it is not clear what is the added value of the paper to answer this question.

Minor comments The meaning of the sentence starting line 29 in section 3.1 is not clear.

Section 3.2 l. 24 : Why the precipitation induced sensible heat flux dominates the heat exchange, it is possible to evaluate it and compare with the heat conduction?

Section 4.1 When speaking about the minimum $\Delta T_{5\text{cm}}$ using absolute values may render easier the reading: even if it's correct: "larger than -0.5C " is a bit confusing.

Panels in Figure 6 are partially commented, if they are not essential they have to be removed or put in the supplementary materials. By the way, units are original!

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-929>, 2018.

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