

Interactive comment on “Hydrologic response of a semi-arid watershed to spatial and temporal characteristics of convective rain cells” by H. Yakir and E. Morin

H. Yakir and E. Morin

msmorin@mscc.huji.ac.il

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Response to Reviewer #1

Reviewer: The authors work on the sensitivity of the runoff to the characteristics of the cells certainly makes a strong case for the need for radar data, or at least a dense network of raingauges (supporting previous work by Bardossy on German data for instance).

Response: We thank the reviewer. We plan to address the reviewer comments and suggestions in the revised manuscript. Below is our response to the specific comment C4479

ments.

Reviewer comment 1: The proposed method appears fairly simple to use, although all the details of the method are not spelled out. The worry is that the technique which is used to track the cells is not disclosed. I assume it is therefore heuristic (p.7733). Can anything more be said about this? It would be interesting to have the authors' opinion as to whether this can be made automatic (using an Artificial Neural Network for instance).

Response to comment 1: Cell tracking was done manually in the current work (see P7733 L3 in the original manuscript). Several automatic tracking algorithms exist (e.g., TITAN, Dixon and Wiener, 1993; SCIT, Johnson et al., 1998), but are problematic for implementation in the current study because most of the rain cells are observed only for 2 or 3 radar maps (see Figure 6 for the cell life span histogram). We will clarify the tracking procedure and add a discussion of this topic in the revised manuscript.

Reviewer comment 2: Also note, when comparing different cell-based rainfall models, that a difference should be made as to whether the model cells are designed to represent physical cells directly or not. The Northrop, and Cox & Isham models, for instance, can indeed be described as having constant intensity over a certain area and for a certain duration (both random), but, unlike the other models listed here, there is cell superposition, so the total precipitation over that area and during that duration will often be the compounded effect of a number of cells (which leads to a noisier profile than the constant intensity of the cell suggests).

Response to comment 2: We agree with this comment. In the revised manuscript we will refer also to this point when describing different rain cell models.

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