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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Hydrometeorological analysis and forecasting of a 3-day flash-flood-triggering desert rainstorm" *by* Yair Rinat et al.

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This paper provides a valuable contribution to the assessment of flash-flood response and the performance of precipitation forecasts in arid watersheds. I am reporting below some comments for paper revision.

The post-flood reconstruction of peak discharge is affected by several sources of errors, including measurement errors and uncertainties in the estimation of the roughness coefficient. The authors could consider assessing and presenting (Table 2 and Fig. 5) the uncertainties bounds of post-flood peak discharge estimates. Indirect estimates of flash flood peak discharge, especially if validated by a rainfall-runoff model,

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like in this work, are of utmost importance for getting a better knowledge of these hazardous phenomena, also for comparison with other datasets. Reporting the uncertainties bounds increases the value of such flood peak data.

Section 4.1.1, which reports field observations by two scientists who witnessed the flood at the Zafit sub-basin, could be extended, for instance by describing the main geomorphic effects of the flood. The title of this section could be modified for emphasizing that it contains direct observations of the flash flood.

Lines 54-56. Not only in arid regions: also under humid climates, the strong spatial gradients of rainfall fields make the rain gauge network inadequate to represent flash flood triggering rainfall.

Line 128. The area of the Zafit sub-basin (46 km^2 - line 91) could be recalled here.

Lines 136-137. The absence of rain gauges within the basin (cf. Fig. 1 and lines 169-170) should be clearly stated.

Lines 140-141. “however, only one of these monitors the area influenced by the storm’s core”: which one (cf. table 2)?

Lines 374-376 and Table A1. Quite low values of Manning roughness coefficients for hillslopes. The works by Downer and Ogden (2002), Engman (1986), and Sadeh et al. (2018), which apparently support these values, are not reported in the references list.

Line 335. “Rain gauges in desert areas fail to represent the spatial heterogeneity of convective rainfall”. In general, this statement sounds rather convincing. In the case of the April 2018 flash flood in the Zin basin, however, the only rain gauge available was located outside the basin, so that no conclusion on the suitability of rain gauge data can be drawn.

Line 337. “whereas”?

Lines 651-652. The final paper, instead of the discussion version, should be reported.

Table 1 lists properties and flood response of 57 sub-basins that in which the flood of April 2018 was analyzed using the GB-HYDRO model. It is not clear why this table is cited in section 2.1, which describes the settings of the study region with a focus on past flood events.

Table 2: I suggest reporting the drainage basin area of the sub-basins.

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