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Characteristics of individual rain events and its dependency on the minimum inter-event time in a dry desert area in north China

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The rain event characteristics was analysed using a pluviograph record of 2008 from an arid desert area of Shapotou in the Tengger Desert, China. Changing the minimum inter-event time (MIT) from 30 min to 24 h alters the number of rain events from 72 to 21. The mean rain rate declines from 0.85 mm h-1 to 0.4 mm h-1, and the geometric mean event duration rises from 0.64 h to 5.04 h. The number of rain events, the mean rain rate, and the geometric mean event duration differed under different criteria of individual rain depth (e.g., 0.1, 0.5, 1.0, 5.0 mm), except that for an individual rain depth of 0.5, 1.0, and 5.0 mm, the features (the number of rain events, the mean rain rate, and the geometric mean event duration) mentioned above are identical for MIT=2 and 3 h. Therefore, there is no need for further identification to set MIT at two or three hours in this specific arid desert area. This wide variation in the properties of rain events indicates that more attention needs to be paid to the selection and reporting of event criteria in studies that adopt event-based data analysis. The selection of a MIT criterion is shown to involve a compromise between the independence of widely-spaced events and their increasingly variable intra-event characteristics (Dunkerley, Hydrological Processes, 2008, 22(26): 5024-5036).