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Characteristics of rainstorms producing floods in the Internal Basins of Catalonia: an analysis using rain gauges, radar, and GIS.

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Floods are the natural hazards that produce the highest number of casualties and material damages in Catalonia. In order to support flood and water resource management, hydrologists generate synthetic events representing future realistic flood situations. Flood simulation studies use spatial-temporal rainfall data input into distributed hydrological models. A correct description of rainfall in space and in time contributes to improvements on hydrological modelling and design. The objective of this contribution is to provide statistical descriptors and distributions for rainfall characteristics of precipitation systems producing floods in the Internal Basins of Catalonia. To achieve this purpose, all flood events recorded between 1996 and 2005 have been analysed. Radar imagery and rainfall data have been introduced into a GIS, and a classification of the events has been done. A distinction between short-lived events, episodes of heavy rain sustained for several hours which can produce catastrophic floods, and episodes of long duration with weak average pluviometric intensity values has been taken into account. By means of weather radar and raingauge data available in this region: velocity and direction of rainfall events, the dimensions of rainstorms, and the spatial distribution of clusters are obtained and analysed. The statistical descriptors and the distributions obtained are of direct use as an input in spatial rainfall generators.