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A synthetic approach to heavy rainfall events in Spain from radar and raingauge data

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Since 1901 to 2000 a total of 217 flood events have been produced in Catalonia (Barnolas and Llasat, 2007), from which more than 130 have last less than a day. Consequently, the major part of the events has produced flash floods in small but torrential rivers located on the coast, where more than a 70% of the population lives. This kind of events is mainly associated to convective precipitation, and for its analysis the integration between radar data and precipitation data in surface is a key issue (Llasat et al, 2006). Catalonia has the advantage of being the best monitored region of Spain, with more than 250 automatic raingauges, four meteorological radars, the longest radar data series (since 1996) and the longest rainfall rate series (since 1921) and monthly precipitation (since 1786) of Spain, as well as historical flood series (since 13^{th} century). Although instrumental flow data dates after 1900, it is also useful to analyse an important number of flood events. This contribution considers all the heavy rainfall events recorded between 1996 and 2000 in Catalonia. By means of weather radar, and applying the 2D radar algorithms a distinction between convective and stratiform precipitation has been made; the precipitation field has been introduced and analyzed with a GIS, in order to classify different kind of events. For each class of event a synthetic approach has been built in order to model the different types of precipitation structures with the aim to be introduced in the future in a hydrological model to obtain the maximum expected flow. After an analysis of the hydrometeorological features of the floods recorded in the Tagus and Ebro Valley, the classification

obtained for Catalonia has been applied to these Spanish basins.