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Characterisation of flash floods based on analysis of extreme European events

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Detailed data enabling identification and analysis of the hydrometeorological causative processes of flash floods have been collected and analysed for 22 flash flood events (80 drainage basins) across Europe. The analysis of simple variables that summarise the large amount of data available for each event has made it possible to outline basic characteristics of flash floods in various morphoclimatic regions of Europe. Flash floods in Mediterranean regions are often caused by longer rainstorms and a flashy behaviour of floods is observed in catchments larger than in other climatic regions. Mediterranean and Alpine – Mediterranean flash floods are characterised by unit peak discharges higher than the events in regions under Alpine and Inland Continental climate. The runoff coefficients of the studied flash floods are usually rather low (mostly < 0.5) and display remarkable differences between the climatic regions investigated. Initial saturation conditions strongly influence runoff coefficients: not surprisingly, the lowest values usually have been observed for flash floods that occurred at the end of a dry period. Also rainfall amount affects runoff coefficient: the values of runoff coefficient increase with increasing storm rainfall. This contributes explaining why Mediterranean events, which are often caused by relatively long rainstorms with large rain rates, have higher runoff coefficients than flash floods in other regions. The studied events usually have very short lag times. A dependence of lag time on basin area and rainfall intensity of the causative rainstorm has been observed.