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Lightning activity, rainfall and flash flooding. Occasional or interrelated events? A case study in the island of Crete.

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The majority of the cyclones passing over Crete in late autumn-early winter are originated from southwest, west and northwest and are of varying size and intensity. Some of these cyclones cause flash floods. The present study reports the preliminary results of the investigation of possible relationships between lighting activity and high precipitation related to flash flood events. In this study an attempt was made to correlate the lightning number and location, recorded by the ZEUS lightning detection system with the rainfall characteristics that caused a number of flash flood events, within the period 2007-2010. Spatiotemporal analysis of rain and rain rate with flash count was performed with respect to distance (radius) of flashes from raingauge location at various temporal scales varying from 10 minutes to event time scale, in order to examine correlation of rainfall, rainfall intensity and lightning activity. Preliminary results for 2008 events, shows increased lightning activity of flood triggering storms. Differences between flood and non flood producing storms need to be further assessed by analyzing more independent parameters, including the synoptic conditions and dominant flash flood hydrological generating processes.