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Variability of Extreme Precipitation Events in Western Iberia

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Extreme rainfall events are amongst the most severe natural hazards that affect southern Europe and are a serious threat due to a wide range of significant human, economic and environmental negative impacts, such as local flooding, erosion and water damage.

In this study we perform an analysis of the space time variability of exceptionally heavy precipitation events occurring over the last century in western Iberia, based on instrumental daily precipitation records recently evaluated by Gallego et al. (2011). Then the synoptic evolution and upper-level dynamic analysis of processes controlling the life cycle of extratropical rain-storms associated with the triggering of the considered heavy precipitation events are assessed using the recently available 20 Century Reanalysis dataset (Compo et al. 2011).

Finally these events, with strong hydrological impact, are assessed based on a cyclone detecting and tracking scheme developed for the Mediterranean region (Trigo et al. 1999) which identifies and follows individual lows, using 6-hourly geopotential data at 1000-hPa from reanalysis datasets. In this presentation we will also analyse the occurrence, variability and trends of these cyclones that produce high impact weather, namely to study the relationship between cyclogenesis and heavy precipitation events and flash-floods. Results are put into perspective with flood risk assessment and water resources availability.

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