



## **Atmospheric instability analysis, lagrangian particle simulation of humidity content and synoptic context leading to the November 1997 MCS in Badajoz, Spain**

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Flooding episode of November 1997 in Badajoz was one of the most dramatic catastrophes in Spain due to mesoscale convective system. It caused 21 deaths and millionaire damages. The episode is described in this work in terms of moisture content evolution by means of individual particle simulation along 3-day back-trajectories. A lagrangian model (FLEXPART6.2) is applied in order to characterize the atmospheric particle involved on focused case (localization, height and specific humidity) which give rise to sudden precipitation stream (128.5 mm/day). Geopotential height and temperature were used to achieve leading synoptical situation presented during heavy rain event. Thermodynamical indices such as Sweat, TT and KI, and dynamical parameters like Potential Vorticity anomaly at 330 K isentropic (PV) surface and Q vector Divergence (dQ) were also quantified to complete the analysis and to give a thorough weather frame taking into account the atmospheric instability. The purpose of this work is to establish preferred synoptical conditions as well as detailing mesoscalar effects by means of moisture sources and instability indices analyses involved in November 1997 spanish severe weather episode.