

AN ANALYSIS OF THE 9-12TH NOVEMBER 2001 WEST MEDITERRANEAN STORM BASED ON PV INVERSION

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ABSTRACT

The structure and evolution of the November 2001 intense cyclone in the western Mediterranean is studied using Potential Vorticity inversion and MM5 numerical simulations. The cyclone was one of the worst storms in the area in the last decades and affected severely the Morocco north coast, Algiers and the Balearic Islands (Spain). The storm produced heavy rain episodes with totals exceeding 200 mm/24 h at some locations, sustained winds of 30 m/s, 700 victims in Algiers and 4 in the Balearics. A large number of PV anomalies in the simulations initial time (10th November 00 UTC) have been considered as potentially relevant dynamical features for the later cyclogenesis process: two interacting vortex embedded in the upper-level large scale trough, PV induced anomalies associated with the upper-level Jet Streak, an upper-level geopotential ridge, other high level anomalies, And the surface positive thermal anomaly over the african plateau, which largely defines the baroclinic nature of the cyclone. These anomalies have been lightly weakened, or reinforced, in the model initial conditions to produce an ensemble of perturbed numerical simulations of the cyclone. The results generally show a high sensitivity of mesoscale features of the cyclone and the induced rainfall and wind field on the initial conditions. These effects are statistically analysed and conclusions on the specific role of each PV anomaly are derived.