

Role of an upper-level trough in the life cycle of a tropical-like cyclone: mesoscale experiments assessed with satellite observations

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The predictability of a tropical-like Mediterranean cyclone or medicane that occurred on 26th September 2006 over Southern Italy is investigated. Using the French non-hydrostatic mesoscale model MESO-NH, numerical experiments starting from various initial atmospheric states were conducted to assess the impact of initial condition uncertainties on the forecast of the track and deepening of the medicane. To generate a set of perturbed atmospheric states, a simple date-shifting initialization method was used. Two sets of simulations were run, using lateral boundaries and initial conditions derived from both the French operational global assimilation system Action de Recherche Petite Echelle Grande Echelle (ARPEGE) and the European Centre for Medium-Range Weather Forecasts (ECMWF) system. Simulations were assessed using in situ and satellite observations. A pronounced sensitivity to the initial conditions was found. They determined whether the medicane was formed, and how much it deepened, and gave rise to a variety of convective signatures that could be verified from space. Preliminary results suggest that the intensification of the medicane was partly related to its passage through the left exit of the upper-level jet.