

# **Assimilation of satellite and lightning data in numerical simulations of tropical-like Mediterranean storms**

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Tropical-like storms are generated in the Mediterranean Sea and can affect islands and continental coastal lands. In situ observations in maritime areas are very scarce and, therefore, the detection and monitoring of these systems must be done through satellite observations. Previous studies show that numerical models are able to simulate the genesis of these features. However, numerical simulations of the phenomena have shown temporal and spatial shift with respect satellite observations. Although, known tropical-like storms did not achieve hurricane intensity, their potential for damage is extremely high due to the densely inhabited Mediterranean countries. Thus, it would be of high interest to obtain successful forecasts of such systems. An attempt of improving the MM5 numerical simulations of these storms will be carried out through the adjustment of the humidity field in the driving ECMWF analyses using satellite and lightning data. Vertical humidity profiles at model grid points will be adjusted depending on the convective or stratiform precipitation type according to satellite and lightning information. This methodology will be applied in two different ways. In one case, the adjustment will be only done in the initial conditions of the simulations. In second case, 3DVar technique will be applied during the simulation. This methodology is applied to a few tropical-like cyclonic situations. Improvements and advantages of this methodology for the forecast of the storms will be discussed