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Ensemble Forecasting on a Tropical – like Cyclone over Southwestern Greece

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In the frame of assessing high impact weather phenomena in the laboratory of climatology and atmospheric science, we used WRF-ARW to simulate the Tropical-like Cyclone (TLC) in south-west of Greece on the 30^{th} – 31^{st} of October 2016. Since, it is reasonably difficult to find and define a universal configuration setup for WRF in order to represent accurately different parameters of these cyclones, we developed a probabilistic approach on a TLC numerical simulation. Therefore, in the current study, we have tested different deterministic simulations of the cyclone approaching the influence of different microphysical, PBL and convection (cumulus) parameterization schemes. In addition to that, an ensemble of the latter has been produced as a product of the different deterministic simulations (perturbations of the ensemble) in order to reach a comprehensive representation of the phenomenon.

The present study aims to evaluate the thermodynamic activity of a Mediterranean tropical – like Cyclone (Medicane – TLC) over southwestern Greece have been evaluated. A resolution of 9 km was achieved to simulate explicitly the storm related parameters downscaling the 38 km spatial horizontal resolution Global Forecast System (GFS) from the NCEP. Moreover, A 3D representation of the cyclone was produced via Vapor in order to evaluate the ensemble product. Furthermore, we validated the simulations output as well as the ensemble mean with satellite gridded data from EUMETSAT, nearby surface observations and upper air soundings.

Finally, the findings of the current study illustrated that the ensemble average displayed a significant difference in performance than the any of the deterministic runs individually, suggesting that ensemble forecasts will be beneficial to be used in studies assessing cyclonic events in Mediterranean.