Towards a long-term climatology of Medicanes

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Medicanes, strong mesoscale cyclones with tropical-like features (axis-symmetry, a warm core, a cloud-free eye surrounded by a cloud cover with spiral shape, winds up to the hurricane speed), are known to develop occasionally over the Mediterranean Sea.

Due to the scarcity of observations over sea and the coarse resolution of the long-term reanalysis datasets, it is difficult to study systematically the statistical and dynamical properties of Medicanes.

Our goal is to assess the Medicanes long-term variability and trends, performing the dynamical downscaling of the NCEP/NCAR reanalysis data for the 1960-2010 period in order to obtain a long-term climatology, and then replying the same procedure on GCM projections for future climate scenarios.

In order to prove the robustness of the method outlined above and to investigate the value added by the use of regional climate models to the study of Medicanes, we performed several climate mode simulations in a high resolution RCM (CCLM) for a number of test cases studied in the literature, and we tested on a five-years model run different algorithms tailored to optimize automatic Medicanes detection in long-term simulations.
We present results on the model ability to reproduce Medicanes test cases and to catch their dynamical characterization, and we then discuss the performance of tracking and detection algorithms.