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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 spiral-shaped cloud cover, winds up to the hurricane speed), are known to develop occasionally over the Mediterranean Sea.

Medicanes are considered rare phenomena, since only a few have been directly observed - the number of cases well documented in the literature is around ten.
However, due to the scarcity of observations over sea and the coarse resolution of the long-term reanalysis datasets, it is difficult to construct homogeneous statistics of the formation of medicanes.

Using an approach based on the dynamical downscaling of the NCEP/NCAR reanalyses, we study in a systematic way the statistical properties of medicanes (annual cycle, decadal and interannual variability, geographical distribution, trends) over the last six decades, and we investigate the linkage between the frequency of medicanes formation and synoptic patterns.

Applying the same downscaling procedure on the atmospheric fields produced by a global model forced with future climate scenarios greenhouns gas concentration, we estimate the impact of climate change on the statistics of medicanes.