



Impact of ocean-atmosphere coupling in horizontal resolution on future projection of Medicanes in the Mediterranean Sea

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Cyclones with tropical characteristics rarely develop in the Mediterranean Sea because atmospheric and oceanic conditions are unfavourable for their development and maintenance. In the Mediterranean Sea, this type of cyclones are called Medicanes (“Mediterranean Hurricanes”). The main aim of this work is to study future climate projections in Anthropogenic Climate Change for these type of cyclones in the Mediterranean basin with the regional model ROM. The characteristics of this model allow us to analyse the effect of the atmosphere-ocean coupling and high resolution on the projections, which has not been addressed so far. The analysis is performed for the future climate scenario RCP85 until 2099. These simulations were done in the framework of European projects MedCORDEX.

The analysis procedure includes the detection of cyclones with a method adapted for mesoscale cyclones (Picornell et al., 2001) and the application of the cyclone phase space method (Hart., 2003) for analysing the structure of the cyclones and detecting tropical characteristics.

Higher-resolution models show greater frequency and intensity of Medicanes compared to lower resolution ones, in agreement with previous results (Gaernet et al., 2018). The comparison of air-sea coupled and uncoupled simulations shows interesting results; for present climate conditions, higher medicanes frequency and intensity is found in the uncoupled simulation. Future projections of medicanes show a overall decrease more pronounced in coupled runs and changes in the intensity of these type of cyclones. The high-resolution coupled run seems to simulate better the summer Medicanes in present climate whereas the uncoupled run overintensify them.

References:

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