



The role of Mediterranean mesoscale eddies on the climate of the Euro-Mediterranean region

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Within the CIRCE (Climate Change and Impact Research: The Mediterranean Environment) EU Project, substantial efforts were devoted to enhance the representation of the oceanic system in the Mediterranean region. This was achieved by developing coupled general circulation models with ocean components which either explicitly resolve, or simply permit, mesoscale circulation features. The inclusion of the eddy variability tail in the spectrum of the processes resolved by the modelled system represents a particularly relevant step forward with respect to the previous CMIP3 generation of climate models, as these were systematically based on coarse resolution ocean components, leading in turn to an extremely rough representation of the Mediterranean Sea sub-system.

In this study the role of mesoscale oceanic features on the air-sea interactions over the Mediterranean region was analysed, in the context of one of the CIRCE ensemble of climate models. To this aim, two different simulations of the 20th Century climate, performed with two distinct configurations of the CMCC coupled general circulation model featuring radically different horizontal resolutions in the Mediterranean Sea domain, were compared.

This comparison highlights the implications deriving from the inclusion of energetic ocean mesoscale structures in the variability spectrum of the coupled ocean-atmosphere system and points to the need for high-resolution ocean components in the development of next generation climate models.