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Ocean Science
Discussions

Interactive comment on "Impact of a medicane on the oceanic surface layer from a coupled, kilometre-scale simulation" *by* Marie-Noëlle Bouin et al.

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Review of the paper

Impact of a medicane on the oceanic surface layer from a coupled, kilometre-scale simulation Marie-Noëlle Bouin and Cindy Lebeaupin Brossier

General comments

A high resolution model is used to study the impact of a medicane on the oceanic upper layer. The analyses of tendency terms show weaker cooling compared to tropical cyclones. Surface heat ïňĆuxes dominate with upper-layer salinity decrease due to

heavy precipitation. The study also shows that the Strait dynamics may impact the role of advection in the medicane processes.

The paper addresses relevant scientific questions on medicane processes related to air-sea interactions in the highly dynamical area of the Strait of Sicily. Important conclusions are reached on the relative importance of the heat and mass fluxes at the sea surface and the vertical mixing in the water cooling of the upper layer.

Generally the text is well written. However, some typos remain to be corrected. Figures are well drawn and clear. If there are points to criticize would be the fact of using a single event and being based only on a numerical model. A quick validation of the model would have given more robustness to the conclusions even if they are largely convincing. The authors could say few words on the advantage of using a coupled model compared to a forced oceanic one. The authors could also present solid arguments on the ability of the model to reproduce the medicane, at least a comparison of the trajectories. A sentence could also be added regarding the added value of using a coupling frequency as high as 15 min.

I recommend minor corrections

Specific comments:

45. Could authors further precise how stronger stratification favour more intense cooling though turbulent mixing at the base of the OML.

126 The simulated medicane spent...Gulf of Gabès: This sentence needs reformulation to better illustrate the area bathymetry.

153. Could you please precise how error bounds are obtained and their significance in the presented comparison. This also may be the case for other values shown in the text.

160. Minimum values...: Please precise that values refer to MLD (SI values are not shown in the Gulf of Gabès).

242-255: Some change values are shown in Table 2, others not. This may be somewhat confusing.

251 : please precise that (-8.E10-9) is a salinity change.

252: According to Fig. 5b, salinisation is shown north of the Gulf of Gabès, not in the Gulf interior.

265: under the MLD : should be OML.

Figure captions: A further detailed description of the figures is recommended.

Fig.15 is a key figure in the paper. A more detailed description of this figure is recommended. Discussions of roles of heavy precipitation, preconditioning and cyclonic eddy may make reference to this figure.

Technical corrections

Some typing errors should be corrected

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