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Ocean Science
Discussions

# *Interactive comment on* "Numerical simulation and decomposition of kinetic energies in the Central Mediterranean Sea: insight on mesoscale circulation and energy conversion" *by* R. Sorgente et al.

**Anonymous Referee #2**

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General Comments

The paper focus on the energetic of the central part of the Mediterranean Sea (the area around the Sicily Channel) in order to investigate the main patterns of the circulation at various temporal and spatial scales. The approach (decomposition of energy and conversion terms, by using a high resolution ocean model) is interesting and can give important information on the dynamics controlling the regional circulation. Although some parts need further clarifications and the text needs improvement (in English and structure), I propose that the paper should be published after revision.



In my opinion, the authors spend too much time describing the plots and they should focus on the main findings (the most interesting or "irregular" features depicted by the model). The division of the domain in 4 sub-basins does not help (most features can be identified in the overall presentation), except in comparing the main characteristics in the sub-domains. This can be achieved by a plot where the energy decomposition can be plotted for the four sub-domains. On the other hand, the authors could focus on specific features that present the most interesting results.

The comparison between the kinetic energy components in several parts needs further elaboration (e.g. change of sign in phi in the Sardinia-Tyrrhenian basin, section 4.2, section 4.2.1, 4.2.3).

Specific Comments

Section 3.1 (Model implementation): You should comment on how the resolution of the atmospheric forcing (is it enough compared to the SCRM resolution?) and the boundary conditions are influencing the findings.

Section 3.2: Please explain, in BEC definition, why and how w' is derived from equation (1) (and not the model results).

Why did you exclude points where the first sigma layer exceeds 1 m?

Section 4.2.2: Does the model reproduce the exchange flow at the Sicily Strait?

When comparing the model results with satellite observation, why are you using only one day and not the whole period or the month you are focusing on?

In several figures and parts of the text the authors compare MKE and EKE and then again describe the phi parameter. I think the second (or the first) is redundant.

There are several typos and phrases that need rewriting:

Title: "energy" instead of "energies"

Page 1162 – l.25: delete “the” from “the kinetic energy”

Page 1162 – l.26: “steady” instead of “stable”

Page 1163 – l.19: it’s not “aerial” (!) it is “spatial”

Page 1163 – l.25: In the phrase “. . .scale of the Mediterranean . . .” delete “of the”

Page 1164 – l.14: change “lacking” with “while there is lack of observations”

Page 1164 – l.19: I guess you not mean “poorly” but “were uncommon”

Page 1164 – l.28: delete “a” at the beginning of the line

Page 1165 – l.6: replace “whom” with “which”

Page 1166 – l.13: “tow-layer”

Page 1166 – l.22: What do you mean by “intensity currents”?

Page 1166 – l.25: “activity”

Page 1167 – l.7: Replace “origins” with “generates”

Page 1168 – l.28: Replace “from” with “of”

Page 1170 – l.14: Replace “denser” with “with more coverage”

Page 1171 – l.2: It’s not “negligee” (!), try “diminish”

Page 1175 – l.1: Replace “motion less” with “motionless”

Page 1175 – l.4: “forms”

Page 1177 – l.10: Replace “approximate” with “relatively smooth”

Page 1178 – l.18: Replace “could also be due to the other different factors” with “could also be due to other factors”

Page 1179 – l.12: Replace “drawing” with “following”



Page 1179 – l.13: Replace “path” with “cycle”

Page 1179 – l.14-15: The phrase needs rewriting

Page 1179 – l.20: Replace “probable” with “is probably related to”

Page 1180 – l.11: Replace “overpass” with “exceeds”

Page 1181 – l.7-8: The phrase needs rewriting

Page 1183 – l.19: “till” (?!)

Page 1184 – l.16: “Highest kinetics” (?!), what do you mean by that?

Page 1186 – l.19: Correct “. . .due to the fact that the core. . .”

Page 1187 – l.12: Replaced “dislocated” with “located”

Page 1189 – l.15: Replace “eddies” with “eddy”

Page 1190 – l.7: What do you mean by “interested”?

There are several typos in the reference section.

Caption of Fig. 3 is wrong (A is not the kinetic energy).

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Interactive comment on Ocean Sci. Discuss., 8, 1161, 2011.