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Ocean Science Discussions

Interactive comment on "Surface signature of Mediterranean water eddies in the North-East Atlantic: effect of the upper ocean stratification" *by* I. Bashmachnikov and X. Carton

Anonymous Referee #1

Received and published: 16 August 2012

Review of "Surface signature of Mediterranean water eddies in the North-East Atlantic: effect of the upper ocean stratification"

This paper studies the sea surface height structure above continuously float-tracked meddies in order to determine the associated surface eddy structures, both anticyclonic and cyclonic that are associated with meddies. The authors determine where and under what conditions meddies can be observed and tracked using altimetry. The life histories of meddies can be complicated with unsteady motions, interactions with other eddies, currents and seamounts, and bifurcations and mergers. Although the variations of observed seas surface anomalies in meddies are complicated, the authors interpret

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Interactive Discussion

Discussion Paper

these variations using the life histories of the meddies. Dynamical arguments are used to support the interpretations. Upper level stratification, latitude, and meddy size were all modeled. In general I like the paper and think it adds significantly to our knowledge of the sea surface signals of meddies. The significance, quality and presentation are very good to excellent.

Do we know why meddies move through the ocean? I was wondering whether meddies propagate like a wave, are self advecting, or are advected by background currents. Can upper ocean currents or another eddy advect a deeper meddy? Are meddies' trajectores influenced by local topography? Maybe all these are relevant. Perhaps a few words about this would help the reader's understanding.

More specific comments:

Title: Suggest using "Northeastern" instead of "North-East."

Abstract, line 1: Meddies are detectable and measureable at the sea surface but are they "visible?" Who sees them?

Abstract, line, 11-12: I suggest you add approximate latitude limits to your "northern subtropics" and "northern tropics." And also add them to Table 3. I am not sure of the relevant latitudes and would like help figuring this out.

Page 2459, 10: Are the surface azimuthal velocities actually measured velocities, or were they calculated from variations of sea surface height?

Page 2460, 3: Suggest using "RAFOS floats' trajectories" or "RAFOS float trajectories"

Page 2461, line 9: To my ear "1.2 times smaller" sounds strange. Maybe use something like 80% as large or 20% smaller?

2464, 10-11: "H is typically 200 m less than H. . ."?

2467-2469: I take on faith the dynamical arguments here. Maybe someone more familiar with the dynamics could comment.

OSD

9, C850–C853, 2012

2468, 7: I think the authors meant to use “temporarily” instead of “temporally.”

2469, 20: Suggest removing the first “the”

2470, 2-3: Sentence needs help. Maybe say: “This is partly compensated by the altimetric tracks becoming closer to each other and the AVISO mesh being reduced from 29 km. . .”

2470, 14: Suggest adding a “the” after “represent”

2470, 17: meddies

2470, 26: Ceres was

2472, 25: Suggest adding “the” before “description” and maybe “of the meddy’s intensity and dynamics” after “description”

2473, 1: in the literature

2473, 11: Not sure what “registered journey” means. Maybe say “tracked journey”?

2474, 18: The -.05–0.15f initially confused me with two minus signs. Suggest rewrite.

2474, 21: Suggest insert “the isopycnals” in “return to” for clarity.

2475, 25-26: The phrase “a mean background flow may shed the surface signal away” sounds strange to my ear and is not clear to me. Maybe use something like “the background flow causes the surface signal to separate from the meddy” or something like this.

2476, 1: Does “its surface signal” refer to the cyclone (as implied) or the meddy?

Table 1: caption says “sorted from weaker to more intense ones.” What was used to judge intensity? Notes below the table use “expandable..BTs” and should use “expendable.”

Fig. 1. Caption: the symbols in panel (a) are dots, or disks, or filled in circles; a circle

OSD

9, C850–C853, 2012

is a line around a center point. The black ring could also be a black circle.

Figure Captions 2 and 3 might want to mention which way the meddies were going, to be clear.

Fig. 6. The “thick grey line with triangles” symbols look to me like dots; all the symbols look similar in my version of the figure, maybe due to my poor eyesight.

Fig. 7. I like this figure a lot, but I was puzzled by it for awhile and couldn’t figure out which curves went with which meddy. To help the poor first time reader I suggest you add small arrows pointing from each meddy name to the two relevant curves for that meddy. The caption mentions circles but shows dots too.

Fig. 8. Caption: Suggest you change H-Rm (implied subtraction) to H, Rm as in Fig 9. Caption mentions grey circles and white circles, which are actually dots or filled-in circles.

Fig. 9. Grey dots. The Meddy B2 symbol is not a circle or a dot. Not sure what it isâĂŤa little house with sloping sides?

Interactive comment on Ocean Sci. Discuss., 9, 2457, 2012.