

Interactive comment on “Surface expression of Mediterranean Water dipoles and their contribution to the shelf/slope – open ocean exchange” by N. Serra et al.

Anonymous Referee #2

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Scientific Significance: The manuscript that deals with the formation and offshore propagation of vortex dipoles addresses a significant topic within the scope of shelf slope exchanges. It re-analyses some important sets of in-situ and remote-sensing observations for two distinct periods, which clearly evidence coherency between intermediate (Mediterranean Water layer) and surface eddies features off the southern coast of Iberia. A modelling approach further completes this description in terms of vertical structures and interactions between the intermediate and the upper ocean circulations. Thus substantial conclusions on the role of the Mediterranean Water layer circulation and meddies and the variability of the upper ocean and shelf slope exchanges are reached.

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The manuscript focuses on shelf-slope exchanges off the western Iberia peninsula. In the framework of the “Deep Ocean Exchange with the Shelf” issue, it would be interesting to detail in the introduction (for example in the paragraph lines 53-64) the overall implication of such interactions between undercurrents and surface flows and the off-shore propagation of eddies and filament formation on shelf-slope exchanges. Are such interactions sparse or frequent? What are the other places around the world ocean where interaction like those described in the paper are likely to occur?

Scientific Quality: The methods used are clearly defined and the assumptions look robust. The presentation of the different data sets (lagrangian, floats, sea surface temperature, sea surface Chl-a concentration, sea surface height anomaly, derived relative geostrophic flow) is quite complete and conclusive. The manuscript revisits experimental results that were previously published by the authors; it gives proper credit to related works done in the region.

Presentation quality: The title reflects the contents of the paper, the abstract is concise and complete, and the text is well structured and clear. Figures are numerous but necessary for the clarity of the paper. Figures captions may be detailed to help the reader (see specific comments).

Specific suggestions

Figures 2 and 6 caption: Add the meaning of the M (for Meddies) and C (for Cyclone). Indicate the depth range of the floats (because “above 1000 m and “below 1000 m” is too vague). Indicate the meaning of the dot for the float trajectory (last position in the period).

Figure 3 and 7 caption: Indicate the depth range of the floats.

Figure 4 and 8 caption: Indicate the depth range of the floats, and the meaning of the dot for the float trajectory (last position in the period) in Fig. 8.

Figure 5 and 9 caption: Indicate the depth range of the floats.

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Figure10 caption: Indicate duration of the overlaid trajectories

Interactive comment on Ocean Sci. Discuss., 6, 2579, 2009.