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Ocean Science Discussions

Interactive comment on "Modelling of the circulation in the Northwestern Mediterranean Sea with the Princeton Ocean Model" *by* M. A. Ahumada and A. Cruzado

Anonymous Referee #2

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The paper describes an implementation of the POM model covering the Northwestern Mediterranean Sea, and one-way nested in the MFS OGCM running a perpetual year climatological run. The paper then shows results typical for the four seasons, and examines them with interesting details. In particular, it is shown that the circulation cannot be described using only simple patterns such as suggested in early litterature. It is shown that the basin-scale gyres are changing with the seasons, that mesoscale features are important all year round (hence justifying the nested model), and that LIW and WMDW are cyclonic all year round.

The paper is written in a clear form, following a rigorous approach, and in a fluent

language. Section 5 describes the results in a systematic and complete way, accompagnied by nice figures. However, a few details about the implementation (section 3), in particular about the nesting procedure, could be a little more developed, and the conclusion of the paper would be more interesting if the results were compared with recent papers.

Specific Comments:

For example, in paragraph 3 I could not find in the article what timesteps are used, or whether the authors did verify that, in their simulation, the Rossby Radius is also 10-20 km.

About the nesting procedure, maybe a little text about the OGCM in which the model is nested would be usefull. E.g. I think the OGCM uses a rigid-lid, while the nesteed model is free surface. Also the spatial resolution and other details of the OGCM could be mentionned, particularly because the MFS model changed the last years and it is not clear which configuration is used. For the internal mode, the authors state that the procedure ensures a net zero transport through the open boundary; but if I understood well, the velocities are obtained through bilinear interpolation. Does the interpolation yield a neglectible error?

Could the authors add a sentence explaining why the tangent velocities are set to zero ?

Paragraph 3.2, it is not written what data is used for the wind stress (from Figure 2 it is the ECMWF reanalysis; it would be usefull to specify the spatial and time resolution of the data).

One thing I would have wished to see, and this is my main remark about the paper, is a paragraph comparing the circulation patterns observed, with those described in recent litterature (which is actually cited in the introduction, but not used furthermore). It is true that the old litterature is not describing the circulation adequately; but the main

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interest of the paper would be to describe what further improvements it brings to other recent papers.

Typos:

Abstract, last sentence: missing "it" or another subject of the sentence.

Section 3, line 4: the resolution of the bathymetry should be 1/12 x 1/12, and not 1/12 x 1/2 (I suppose).

Section 5: LIW and WMDW abbreviations are used (line 8) before they are defined (line 27).

Interactive comment on Ocean Sci. Discuss., 3, 1255, 2006.