**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

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Reply to the Anonymous Referee

We would like to thank the anonymous referee for his constructive comments. As a result, the submitted manuscript will be modified in the following aspects:

1) Last sentence in the Abstract:

Finally, concerning the circulation in the lower layers, the model results have confirmed that the Levantine Intermediate Water (LIW) and the Western Mediterranean Deep Water (WMDW) follow essentially a cyclonic path during all year.

2) Paragraph 3.2:

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were tx and ty represent the surface wind stress components obtained from the European Center for Medium-Range Weather Forecasts (ECMWF) 1979-1993, 6-h reanalysis data on a regular 1° by 1°grid (for more details about these data see Korres and Lascaratos, 2003)

3) Section 3, line 4:

The bottom topography is based on the U.S. Navy Digital Bathymetric Data Base 5 (1/12° x 1/12°)

4) Section 5, lines 7 and 8:

It is quite evident that the Levantine Intermediate Water (LIW) (Fig. 12, upper panel) and the Western Mediterranean Deep Water (WMDW) (Fig. 12, lower panel)

5) Concerning the OGCM description

3.1 Open lateral boundary conditions:

Along the two open lateral boundaries, the NMS model is forced with velocity, salinity, and temperature fields obtained from the 8th year of the Mediterranean Sea OGCM climatological integration (perpetual run year). This Mediterranean Sea model is based on the rigid lid Modular Ocean Model (MOM), which was configured with a horizontal resolution of 1/8° x 1/8° and 31 vertical levels, and it was forced by the same atmospheric data set used here. For more details about the model configuration see Demirov and Pinardi (2002) and Tonani (2003).

For the internal mode, velocities normal to the open lateral boundaries were specified from the OGCM outputs, ensuring at each time step a zero net volume transport on the open boundary. To do this, we applied the procedure described in detail by Zavatarelli et al. (2002), Korres and Lascaratos (2003), and Zavatarelli and Pinardi (2003). On the other hand, after several sensitivity tests to different formulations for the open lateral boundary conditions, the NMS model solution did not show overly sensitive to the velocity component tangential to the open lateral boundaries. For this reason, in this

particular experiment, we set it to zero.

Regarding the external and internal time steps

They are specified in Table 1, which is cited at the end of the first paragraph of the Model Results and Discussion section. We did not verify that the Rossby radius is 10-20 km.

Finally, about the discussion, we are working on it

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

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