Modelling the Surface Circulation of the Eastern Mediterranean Sea

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A primitive equation OGCM (Ocean General Circulation Model), see CANDOUNA (1991, [1]) is used to study the circulation of the Eastern Mediterranean Sea and its seasonal variability. The model domain extends westwards to 15°E and northwars to 40°N. Straits and channels are artificaly assumed to be closed at all boundaries. The initial and upper surface boundary conditions are prescribed by the monthly mean temperature values and the annual mean salinity values of the climatological LEVITUS data set, LEVITUS (1982, [3]), while the atmospheric forcing by the HELLERMAN and ROSENSTEIN climatological windstress data set, HELLERMAN and ROSENSTEIN (1983, [2]).

The run becomes quasi-stationary after 20 years of integration and the spin up time is about 12 years. Large-scale circulation patterns, such as the Mid Mediterranean Current (MMC), the Ionian Atlantic Stream (IAS) and the Cilician Current can be succesfully simulated by the model. Inconcistencies in the circulation pattern are located where mesoscale eddies are expected; e.g. the West Cyprus Cyclone (WCC) in the northwestern Levantine Basin, the Cretan Sea Cyclone (CSC) and the Rhodes Cyclone (RC), southwest and southeast of Crete. The model forms an anticyclonic eddy at the same location of the Shikmona Anticyclone (SA), but however, there is not any indication of an eddy at the location of the Mersa-Matruh Anticyclone (MMA).

The OGCM used in this study has been developed by Dr. E. MAIER-REIMER at the Max-Planck-Institut for Meteorology. The numerical experiments have been performed there too, as part of the author's M.Sc. thesis.

REFERENCES

[1] CANDOUNA M.A., 1991.- "Seasonal Circulation Patterns in the Eastern Mediterranean Sea: Observations and Model Results", M. Sc. Thesis at the Max-Planck-Institut for Meteorology, submitted to the University of Hamburg, (105pp.).
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[3] LEVITUS S., 1982.- "Climatological Atlas of the World Ocean", *NOAA Professional Paper*, *Rockville Md*, 13, (173 pp.).