



Comparison of forecast and observed internal tides in the Eastern Mediterranean Sea

C. Horton and M. Clifford

Naval Oceanographic Office, Stennis Space Center, Mississippi, USA

hortonc@navo.navy.mil

The Naval Oceanographic Office operationally runs a forecast system for the Mediterranean Sea built around a version of the Princeton Ocean Model (POM) forced by winds and tides. The model implementation has 3.2-km horizontal resolution and 47 sigma levels in the vertical. The original pressure gradient scheme has been replaced with one allowing steep bathymetry, and the model bathymetry has been only minimally smoothed and has no restriction upon steepness. The relatively high resolution of the model, the incorporation of barotropic tides, and the realistically steep bathymetry allow the model to generate internal tides.

In order to facilitate the testing of the forecast system, profiling drifters have been deployed in the Mediterranean Sea, and the CTD profiles from these drifters (available on the ARGO server) are assimilated by the modelling system. Normally, these profilers measure only a single deep cast each cycle, but we worked with the manufacturer to allow a “bounce” cycle to be inserted between each deep cycle. A bounce cycle is a sequence of 7 consecutive shallow profiles at 2-hour intervals, and each profile extends from 140-m to 40-m depth with a 20-m resolution. Only temperature is measured in this cycle.

Profiling drifters with the bounce cycle have been deployed south of Crete and Cyprus and have provided new bounce cycles at 5- or 6-day intervals. The drifting of the

profilers has provided for some measure of the spatial and temporal variability of the internal tide signal. A compilation of observations will be shown along with a discussion of the usefulness and limitations of the bounce cycle. Specific observations will be compared with model forecasts for the purpose of understanding how well the forecast system predicts the strength and spatial variability of internal tides.