STEADY-BAROTROPIC CIRCULATION IN THE CILICIAN BASIN AND ON ITS SHELF AREAS.

Ümit Ünlüata, Temel Oğuz and Halil İ. Sur

Middle East Technical University
Institute of Marine Sciences
P.K.28 Erdemli-İçel-TURKEY

Abstract

Steady-barotropic motions induced in the Cilician Basin by local winds and general circulation of the Eastern Mediterranean are examined utilizing a linear, frictional f-plane model. The region is modelled as a rectangular east-west running channel with a wide and relatively flat cross-section (:ınterior) that is flanked by a steep and narrow shelf. The flow due to general circulation impinges from east to provide an upstream boundary condition for the motions within the basin. In the absence of the upstream flow wind induced motions are driven by the curl of wind-stress in the interior and by the longshore wind-stress component on the shelf. Interior motions provide additional forcing to the shelf waters but are not influenced by the longshore wind-stress driven flow taking place on the shelf.

Interior and shelf motions are greatly influenced by the influx from east. Again, the interior is decoupled from but provides forcing to the shelf circulation. Motions generated by the upstream flow eventually concentrates at the shelf edge.

In both cases of wind and upstream driven flows, the shelf motions generated by the interior cannot penetrate entirely onto the shelf and are concentrated near the shelf edge. This is due to the vorticity insulating effect of the steep shelf. On the other hand, the longshore driven flow on the shelf are trapped near the coast. Consequently, mid-shelf motions are primarily due to upstream inflow.