Abstract View

Volume 6, Issue 6 (November 1976)

Journal of Physical Oceanography
Article: pp. 810–827 | Abstract | PDF (1.23M)

Maps from the Mid-Ocean Dynamics Experiment: Part I. Geostrophic Streamfunction

James C. McWilliams

National Center for Atmospheric Research, Boulder, Colo. 80303

(Manuscript received January 26, 1976, in final form July 30, 1976)

DOI: 10.1175/1520-0485(1976)006<0810:MFTMOD>2.0.CO;2

ABSTRACT

From measurements made during the 1973 Mid-Ocean Dynamics Experiment in the western North Atlantic, horizontal maps of the total dynamic pressure (or, in the geostrophic approximation, streamfunction) have been constructed for different vertical levels and time periods by the interpolation technique of objective analysis. The space and time sampling of the observations—several tens of kilometers horizontally, hundreds of meters vertically and several days in time—were adequate for resolving mesoscale eddies. The data consisted of velocities (displacement rates) at 1500 m depth from neutrally buoyant floats and vertical density profiles throughout the water column. The resulting maps have been considered from several, essentially phenomenological, points of view. These include descriptions of the synoptic eddy structure, the time evolution and propagation of the eddies, the adequacy of linear modal vertical structure, and the correspondences and energy partition between motions in the two vertical modes.