Abstract View

Volume 5, Issue 2 (April 1975)

Journal of Physical Oceanography
Article: pp. 201–221 | Abstract | PDF (1.66M)

Normal Modes of the Atlantic and Indian Oceans

George W. Platzman

Department of the Geophysical Sciences, The University of Chicago, Chicago, Ill. 60637

(Manuscript received August 29, 1974, in final form December 4, 1974)

DOI: 10.1175/1520-0485(1975)005<0201:NMOTAA>2.0.CO;2

ABSTRACT

Normal modes are calculated for a homogeneous ocean occupying a connected domain consisting of the North Atlantic, South Atlantic, and Indian Oceans. Coastal configuration and bathymetry are resolved on a grid of 675 six-degree Mercator squares. The calculation is based upon the Lanczos process and is more efficient than resonance iteration. Twenty-six gravity modes were found with periods greater than 8 h, the slowest being a fundamental mode of about 67 h. The North Atlantic co-oscillates with the South Atlantic at a period of about 42 h, and has strong resonances at 23, 21, 14.4, 12.8, 8.6 and 8.3 h. Eleven topographically-induced modes of rotational type were found with periods less than 100 h; the fastest of these is a 44 h mode in the Weddell Sea. In the 6° model the fastest rotational mode of the North Atlantic is a 55 h topographic wave most prominent near the Grand Banks of Newfoundland.