Abstract View

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Numerical Modeling of Equatorial Waves in the Presence of a Mean Current

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ABSTRACT

The purpose of this paper is to investigate the effect of a mean circulation, with latitudinal and vertical shear, on the equatorial oceanic waves. We have developed a periodic model in order to calculate the perturbation of the given mean flow. Analysis of these fluctuations by a Fourier method allows us to identify the excited frequencies. The vertical and latitudinal structure of each wave is then studied. We have dealt with two initial situations corresponding to the circulation in the equatorial Atlantic during summer and winter. In these two cases, we get a westward propagating Yanai wave of 18-day period which seems to be related to the mean current. Another important feature is the existence of an unstable, westward propagating wave, of period 24 days and wavelength 1000 km, which appears only during the summer, when the westward surface currents are strong.