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Trapped Coastal Waves on an Equatorial Beta Plane

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ABSTRACT

This paper describes the zonally propagating wave modes of a homogeneous fluid on an equatorial beta-plane with linear bottom topography. The fluid is bounded above by a free surface and bounded below by a depth profile that increases linearly with distance away from a beach that is parallel to the equator and located some distance either north or south of it. The governing equation for the wave amplitude is solved numerically to obtain dispersion relations and mode structures of waves trapped against the beach. These are interpreted in the light of existing knowledge of trapped modes on a sloping beach on an *f*-plane and of trapped modes on an equatorial beta plane with a flat bottom. Both gravity modes and low-frequency topographic modes are included in the analysis.

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