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Equatorial Waves in the Presence of the Equatorial Undercurrent

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ABSTRACT

Because of the narrow region over which it has high speeds, the Equatorial Undercurrent has little effect on long waves with large phase speeds, such as long Kelvin and equatorially trapped inertia-gravity modes with equivalent depths ≥ 30 cm. The Rossby branch of the Rossby-gravity family, and the gravest Rossby modes, have phase velocities comparable to the maximum speed of the Undercurrent and are significantly modified by this current. Meanders of the Undercurrent that are due to superimposed neutral (non-amplifying) waves must have westward phase propagation; standing or eastward traveling meanders are possible only if the Equatorial Undercurrent is unstable.

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