Gulf of Mexico: Topographic Rossby Waves along the Sigsbee Escarpment

In the early 1990s, documented bursts of strong deep currents arrived along the continental slope seemingly out of nowhere. Motivated by the risk to energy-sector operations, a series of observational studies were launched at the base of the steep Sigsbee Escarpment. A picture emerged: properties of these strong deep currents were consistent with topographic Rossby waves and it was hypothesized that they were generated at sites where the Gulf of Mexico Loop Current interacted with topography. A gap in our knowledge remains: how does the wave energy propagate from the generation region to the steep escarpment? This project will develop a wave-tracing algorithm with an eye towards creating a predictive toolkit.

In-residence

Programing experience in Matlab or Python
Course work: vector calculus and ordinary differential equations

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Students may contact us