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Bottom shear stress and pressure perturbations under an internal solitary wave[1] GUSTAVO RIVERA, PETER DIAMESSIS, Cornell University — The bottom boundary layer (BBL) under a mode-1 internal solitary wave (ISW) of depression propagating against an oncoming model barotropic current is examined using 2-D direct numerical simulation based on a spectral multidomain penalty method model. Use of a postprocessing projection onto a modified set of divergence-free basis functions enables investigation of wave-based Reynolds numbers within the range $[10^5, 10^6]$. At sufficiently high ISW amplitude, the BBL undergoes a global instability which produces intermittent vortex shedding from within the separation bubble in the lee of the wave. The interplay between the bottom shear stress field and pressure perturbations during vortex ejection events and the subsequent evolution of the vortices is the focus of this presentation. Implications for resuspension of bottom particulate matter are discussed in the context of specific sediment transport models.

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