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**Internal gravity wave absorption and reflection in a non-uniformly stratified Boussinesq fluid and subcritical Richardson number** MICHAEL RICHTER, AMMAR ABDILGHANIE, PETER DIAMESSIS, Cornell University — 2-D numerical simulations of the reflection and absorption of internal gravity waves in a non-uniformly stratified Boussinesq fluid are reported. The stratification profile combines a surface mixed layer separated from a uniformly stratified bottom layer (where waves are generated) by a sharp hyperbolic tangent pycnocline. The role of the incident wave steepness, the ratio of the vertical wavelength to the pycnocline thickness, and the peak pycnocline stratification strength in the reflection and absorption of the internal waves is studied. A hyperbolic tangent velocity profile collocated with the stratification profile is then introduced. The shear profile is such that a critical level exists inside the pycnocline and the gradient Richardson number is subcritical. Finally the influence of the stability of the shear flow on the wave reflection and absorption is appraised. Simulations are performed with and without an externally destabilized shear layer.

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