



The reflectance of uniform slopes for normally incident interfacial solitary waves

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The collision of interfacial solitary waves with sloping boundaries may provide an important energy source for mixing in coastal waters. Collision energetics has been studied in the laboratory for the idealized case of normal incidence upon a uniform slope, but before the results can be recast into an ocean parameterization, contradictory laboratory findings must be addressed, as must the possibility of a bias owing to sidewall effects. As a first step, we have revisited the laboratory results in the context of numerical simulations performed with a nonhydrostatic laterally-averaged model. We show that the simulations and the laboratory measurements match closely, but only for simulations that incorporate sidewall friction. More laboratory measurements are called for, but in the meantime the numerical simulations done without sidewall friction suggest a tentative ocean parameterization for the reflection of interfacial solitary waves upon impact with uniform slopes.