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Internal Wave Attractors: Topographic effects on wave reflection and energy propagation ROB SUTTON, STUART DALZIEL, Cambridge University — It is well known that the angle of propagation of internal gravity waves depends on the ratio of the frequency of the waves to the buoyancy frequency of the stratification. This constraint on the direction of propagation causes the wavelength of an internal wave to either increase or decrease when it reflects from a sloping boundary. Such geometric focusing can lead to wave energy being enhanced in predictable regions of the ocean, giving rise to the possibility of an internal wave attractor where the energy is focused onto a limit cycle. In this paper we revisit internal wave attractors in a simple trapezoidal tank, exploring how the structure of the attractor is disrupted by replacing the sloping boundary with a staircase configuration comprising only horizontal and vertical surfaces. Simple ray tracing suggests an attractor cannot form in such a geometry despite the macroscopic shape remaining unchanged. We explore this configuration experimentally, varying the length scale of the individual steps, demonstrating an evolution towards the classical attractor as the step size is decreased.

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