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Tsunami propagation using a consistent acoustic-gravity wave formulation STEFAN LLEWELLYN SMITH, MAE, UCD — Recent tsunamis such as the 2004 Sumatra tsunami, the 2010 Chile tsunami and the 2011 Tohoku tsunami have led to considerable loss of life and economic repercussions. The existing literature on tsunamis covers the full problem of tsunami generation, propagation and runup, with the goals of tsunami warning and preparedness being a major topic. The simpler question of tsunami propagation in the open ocean still raises a number of questions. Tsunamis propagate at the shallow water wave speed, which in a typical ocean is hundreds of meters per second. Compressibility effects are potentially important, in particular when it comes to the first arrival time and behavior of the leading front of the disturbance. Previous work has examined the effect of compressibility using a formulation based on the hypothesis that the fluid motion is barotropic, Consequently the fluid motion remains irrotational at all times if it is started from rest. We reconsider the effect of compressibility in tsunami propagation without using the assumption of barotropic flow. For a model problem with constant sound speed and buoyancy frequency, the causal Green's function is calculated and the solution to the initial-value problem with specified displacement at the lower boundary is then examined. The effect of r

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