

Abstract Submitted
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Impulsively generated axisymmetric free surface waves and drops¹ KUAN-KHOON TJAN, WILLIAM R.C. PHILLIPS, University of Illinois at Urbana-Champaign — The axisymmetric evolution of a body of liquid occupying the half-space subjected to a Gaussian impulse in pressure is considered. Under the inviscid assumption, the problem is recast into a Fredholm integral equation of the second kind. The non-dimensional parameters controlling the non-linear (due to the presence of a free surface and the Bernoulli equation) evolution are the Weber and the Froude numbers. Two different drop formation mechanisms are identified: one in which a nearly spherical drop is ejected away from the free surface when the Weber number is moderate and the Froude number is large. The second, as the Froude number is reduced, is a tear shape drop which is formed as the surface collapses onto itself under the influence of gravity. A phase diagram identifying the various regimes will be presented, depicting the above mentioned cases and also that when no drops are formed and the surface evolves into an axisymmetric wave.

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