Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Liquid spray experiments GARY LAPHAM, Maine Maritime Academy, JOHN MCHUGH, University of New Hampshire — When waves on the ocean surface interact with a solid object, the result is often a complex pattern of spray. The solid object may be a coastal barrier such as a breakwater, or a ship or drilling rig. Another spray-related case is the presence of large industrial tanks of liquid, and often dangerous liquids, that exist around the world. Tens of thousands of such tanks are rapidly becoming obsolete. Recent experience has shown that when such tanks burst, the resulting spray may shoot several hundreds of meters from the tank. These tanks often have a wall or dam (barrier) surrounding them in an attempt to contain any leakage, catastrophic or otherwise. When the tank bursts it is akin to the dam-break problem. A wall of water rushes forth and impinges on the barrier creating spray. Previous experiments (McHugh and Watt, 1998) considered the related configuration of a solitary wave impinging on a vertical wall. The present experiments more closely model the bursting tank case, and treat the effect of the distance between the tank and barrier. Results show that there is a sweet spot where height and horizontal distance of spray droplets are maximized. This ideal distance between tank and barrier is constant when scaled by the initial tank depth.

John McHugh
Univ of New Hampshire

Date submitted: 04 Nov 2016 Electronic form version 1.4