1052-76-195 **J. H. Duncan*** (duncan@umd.edu), Department of Mechanical Engineering, University of Maryland, College Park, MD 20815, and **J. D. Diorio**, Department of Mechanical Engineering, University of Maryland, College Park, MD 20815. *An Experimental Investigation of the Wave Pattern Generated by a Moving Pressure Source: Solitary Capillary-Gravity Waves.*

The wave pattern generated by a small pressure source moving across a water surface at speeds less than the minimum phase speed for linear gravity-capillary waves ($c_{min} = 23$ cm/s) was investigated experimentally. The resulting wave pattern was measured using cinematic shadowgraph and laser-induced fluorescence (LIF) techniques. The results show the existence of several distinct behavioral states. At low speeds, no wave behavior is observed and the pattern resembles the symmetric stationary condition. However, at a critical speed, but still below c_{min}, the pattern undergoes a sudden transition to an asymmetric state with a stationary, 2D solitary wave that forms behind the pressure source. This solitary wave is elongated in the cross-stream relative to the stream-wise direction and resembles gravity-capillary "lumps" observed in previous numerical calculations. As the translation speed approaches c_{min}, another time-dependent behavior is observed characterized by periodic "shedding" from a V-shaped solitary wave pattern. This work will be discussed in conjunction with the recent numerical calculations of T. Akylas and his research group. (Received August 27, 2009)