Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Impact of Plunging Breaking Wave on a Partially Submerged Cube[1] A. WANG, C.M. IKEDA, J.H. DUNCAN, University of Maryland — The impact of a plunging breaking wave on a partially submerged rigid cube ($L = 30.5$ cm) is studied experimentally in a wave tank that is 14.8 m long, 1.15 m wide and 2.2 m high with a water depth of 0.91 m. A single repeatable plunging breaker is generated from a dispersively focused wave packet (average frequency of 1.14 Hz) that is created with a programmable wave maker. The water surface profiles at the vertical center plane of the cube are measured with a cinematic LIF technique. The cube is centered in the width of the tank and mounted from above with the front face oriented with its normal in the vertical long center plane of the tank and tilted at angles of 0 and 20 degrees downward relative to horizontal. For the range of horizontal cube positions used here, during the wave impact, the water free surface forms a circular arc between the water contact point on the front face of the cube and the wave crest. As the wave impact continues, this arc converges to a point and a fast-moving vertical jet is formed. The effect of the submergence and tilt angle of the cube on the jet formation are explored.

[1]This work is supported by the Office of Naval Research.

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Date submitted: 27 Jul 2012 Electronic form version 1.4