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Hydrodynamics of solid objects impacting on free surface fluid DEEPAK KUMAR PANDEY, HEECHANG LIM, Pusan National University — The impact studies of different shape and size of solid objects and curved plates on the free surface of fluid have a great practical significance from engineering perspectives. It is worth noting here that such type of impact phenomena can be correlated with slamming of ship bow, seaplanes, submarines, military projectiles, etc. in the seawater. The objectives of this paper are to experimentally and numerically analyze the field variables (pressure distribution, splashing, wave propagation, etc.) arising out of free fall of different shape and size of solid objects (square prism, rectangular prism, triangular pyramid, cylinder, sphere, etc.) on the free surface of the fluid. The fluids employed were water and oils having different viscosity. During the experiments, free-falling solid objects as projectiles were allowed to impact the free surface of the fluid. The height and the angle of the free falling solid objects were also varied in order to observe its effect on splashing and wave propagation. The interface behaviors and wave propagation have been captured using a high-speed camera. However, pressure sensors and strain gauges were employed in order to record the pressure and impact load at different locations. The simulation results validate the experimental results.

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