

Visual observations of the flow around a half-submerged oscillating circular cylinder

Sadatoshi Taneda

Kurume Institute of Technology, KamitsuKurume 830Japan

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Visual observations are made on the flow around a horizontal circular cylinder which is half-submerged in still water and forced to oscillate vertically. The ends of the cylinder have great influence on the wave pattern and flow field. Progressive plane waves are generated at small forcing amplitudes, but cross-waves are superimposed on the progressive plane waves at large forcing amplitudes. The wavelength of the cross-waves in the direction parallel to the cylinder axis increases with the forcing amplitude. The crests of the cross-waves are in parallel lines which are oblique to the cylinder axis. The angle at which the parallel lines meet the cylinder axis decreases as the forcing amplitude is increased. Three kinds of steady flows are induced in the water: surface flow, undersurface flow, and vertical jet.

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