

## Various Nonlinear Phenomena observed in Surface Water Waves

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Among various water wave phenomena in which the nonlinearity plays an essential role, a few interesting phenomena will be chosen and reviewed briefly. The selection will include (1) the large-amplitude steadily propagating water wave solutions, their stability and breaking, (2) the oblique interaction of solitary waves, the two-dimensional K-dV equation, soliton resonance, and the anomalous reflection pattern called Mach reflection which happens when a tsunami hits a breakwater with a large angle of incidence, and (3) the theory of nonlinear interactions among component waves of random wave field with a broad-band spectrum, verification of the theory by direct numerical simulation of the primitive equations for the water waves.