An asymptotic model equation for surface waves in deep water

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Abstract

In the limit of small values of the *aspect ratio parameter* which measures the amplitude of a surface wave in units of its wave-length, a model equation is derived from the Euler system in infinite depth (deep water) without potential flow assumption. The resulting equation sustains periodic waves and stable soliton-like solutions. The system is related to the integrable Bullough-Dodd integrable system.