

STATIONARY SOLITARY WAVE SOLUTIONS OF THE FORCED KDV EQUATION

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ABSTRACT. The Korteweg-de Vries (KdV) equation with a forcing approximately describes the evolution of the free-surface when a fluid flows over an obstacle. This forced KdV equation is related to physical problems such as shallow-water waves over rocks, atmospheric and oceanic stratified flows encountering topographic obstacles, and acoustic waves on a crystal lattice. In this talk, we present the stationary Korteweg-de Vries (KdV) equation with a forcing for a flow of an inviscid and incompressible fluid. The stationary fKdV equation is defined in an infinite domain and it is reduced to a bounded domain by introducing absorbing boundary conditions. A new numerical method is proposed to solve this boundary value problem. New multiple numerical solitary wave solutions of the stationary KdV equation are discussed for various forcings. Numerical examples are provided to confirm and illustrate the accuracy and effectiveness of the method.

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