DIFFRACTIONLESS SOLUTIONS FOR THE BOUND STATES OF THE MODEL 1D THREE-BODY PROBLEM

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The model of the one-dimensional impenetrable particles with interactions via the boundary conditions is considered. This model, besides its relation to the three-body problem [1-3], describes also the wave diffraction problem for the impedance wedge [4]. Previously, an exact solution was obtained by means of the Maluzhinetz-Sommerfeld transformation [4,2,3]. In the present report it was found that the bound-state solution turns out to be in the diffractionless (Bethe ansatz) form. A simple analytical expression for the eigenvalues is given. The relation to this model problem to the zero-range interaction problem [5] is discussed.

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