Soliton interactions with an external forcing: The modified Korteweg-de Vries framework

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Keywords: solitons, trapped waves, modified Korteweg-de Vries equation, asymptotic theory

MSC2020 codes: 34A34

Abstract The aim of this work is to study asymptotically and numerically the interaction of solitons with an external forcing with a variable speed using the forced modified Korteweg-de Vries equation (mKdV). We show that the asymptotic predictions agree well with numerical solutions for forcings with constant speed and linear variable speed. Regarding forcing with linear variable speed, we find regimes in which the solitons are trapped at the external forcing and its amplitude increases or decreases in time depending on whether the forcing accelerates or decelerates.

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