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# Multi-solitons interaction with higher nonlinearity effects in an extended Schrödinger equation

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## Abstract

We considered an extended nonlinear Schrödinger with the third and fourth order space-derivatives that is known to have one-soliton and rogue solutions. We have transformed the model to a homogeneous model that is utilized to show the existence of interacting multi-soliton solutions. We have analyzed, and gave specific forms of these new class of N-solitons in a new simple form and discussed the interactions of these multi-solitons. We have shown the existence of three types of head-on collisions, head-on collisions with or without over-taking or splitting into two solitons.

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