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Soliton Solutions in Three-Component Bose-Einstein Condensates

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Abstract: We obtain soliton and plane wave solutions for the coupled nonlinear Schrödinger equations, which describe the dynamics of the three-component Bose-Einstein condensates by using the Hirota method. Meanwhile we find that the system which has attractive atomic interaction will only possess a shape changing (inelastic) collision property due to intensity redistribution in the absence of the spin-exchange interaction. As a discussed example, we investigate the one-soliton, two-soliton solutions and collisional effects between bright two-soliotn solution, which lead to the intensity redistribution.

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