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Collision of Acoustic Multi-Soliton and Soliton-Breather in Magnetized Dusty Plasma

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Abstract—The penetration of ultrashort ‘Breather’ like pulse in a dense dusty magnetized plasma is governed by the Maxwell equation and Korteweg-De Vries equation. In this article we have used KdV like equation from our previous work to study the interactions. Using Hirota’s Direct method we obtain multi-soliton solution. The interaction between of the multi-solitons comprehends the internal shocks of such plasma. We have considered linear polarized laser equation for Breather like structure. To study the Soliton-Breather interaction we used energy conserving numerical scheme and compared the results for circularly polarized and linear polarized ultrashort laser beam. The outcome may be beneficial to follow the interaction of laser and highly magnetized dusty plasma in both laboratory and astrophysical plasmas.

Keywords— Electron Acoustic Wave, KdV equation, Multi-soliton solution, Ultra-short laser, Soliton Breather interaction

Reference

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