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Head-on Collision of Two Solitary Waves in a Plasma RAVINDER KUMAR, Janta Vedic College Baraut, Uttar Pradesh, AJAY K. SINGH, Dronacharya College of Engineering Farrukhnagar, Haryana, OMVEER SINGH, HITENDRA K. MALIK, RAJ P. DAHIYA, Indian Institute of Technology Delhi —
Solitary waves have been very fascinating due to their applications in various fields of science and engineering. A solitary wave when retains its shaper after having collision with another solitary wave is called a soliton. The soliton structure can trap particles and convect them over large distances in the laboratory, astrophysical and space related plasmas. Therefore, they can contribute to the transportation of anomalous particles and the energy from one region to another. The aim of the present work is to investigate the head-on collision of two solitary waves in a multi-component plasma having ions, two types of electrons and dust grains under the effect of magnetic field and charge fluctuation of the dust grains. Using extended Poincare-Lighthill-Kuo (PLK) method, we derive a coupled equation that carries the contribution of oppositely propagating solitary waves and their phase relationship. By solving this coupled equation, we obtain the trajectory of both the solitary waves and finally calculate the phase shift taken place during their head-on collision.

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