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Effect of collisional frequency on the relativistic solitons in the intense laser - plasma interaction

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Abstract

Short and intense laser pulses in laser-plasma interaction stimulate various local structures like solitary waves in the plasma. Relative solitons should be given special attention because the amplitude of the electromagnetic field is intense enough to set plasma electrons in relativistic motions. In the interaction of intense laser with plasma, collisions can play an important role in the physical phenomena. In this paper, the effect of the collision on the emission of solitons is investigated by considering the interaction of an intense laser with plasma. Then, the NLS equation is numerically solved and the different results are compared with each other. Also, the stability conditions of individual waves and the effect of the collision on these waves are investigated.

Keywords: Laser-plasma interaction, Relativistic solitons, NLS equation, Instability

For full article, refer to the Persian section