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RELATIVISTIC SOLITONS IN A MAGNETIZED ION - BEAM PLASMA SYSTEM

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Abstract

Formation of ion-acoustic solitary waves in a weakly relativistic magnetized plasma for $Q'\left(=\frac{m_b}{m_i}=\frac{\text{beam mass}}{\text{ion mass}}\right)>1$ or <1 subject to $v_{s\xi 0}-v_{b\xi 0}=U_d\sin\theta$ is investigated, where $v_{s\xi 0}$ is the ion initial streaming, $v_{b\xi 0}$ is the beam initial streaming and U_d is the beam drift perpendicular to the direction of magnetic field. It is found that for heavier concentration of beam ions Q' (>1), the amplitudes of solitons decay considerably with increase in Q'. It is further observed that the maximum amplitude occur in the vicinity of $Q'\approx 1$. The amplitudes of the solitons are found to be higher near the magnetic field.

Key Words : *Ion-beam, Ion-acoustic, Solitary wave, Relativistic soliton, KdV.*