Abstract

A degenerate relativistic three-component plasma model is proposed for ultra-low frequency shock dynamics. A reductive perturbation technique is adopted, leading to Burgers' nonlinear partial differential equation. The properties of the shock waves are analyzed via the stationary shock wave solution for different plasma configuration parameters. The role of different intrinsic plasma parameters,

especially the relativistic effects on the linear wave properties and also on the shock dynamics, is briefly discussed.