

Quasi-periodic variation of the supercritical perpendicular shock structure in a two-ion-species plasma

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Supercritical perpendicular shock waves propagating in a two-ion-species plasma are studied using a one-dimensional electromagnetic hybrid code. It is found that, as the number density ratio of heavy ions to protons is increased, the shock with a moderately high Mach number becomes more dynamic and changes its structure periodically. We also find that the excitation of a magnetosonic wave in the shock downstream region, which results from the relative motion between the proton and the heavy ion flows, causes the periodic variation of the shock structure.