

Particles acceleration in quasi-perpendicular non-relativistic High Mach number shocks

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Electron and ion acceleration at a non-relativistic collisionless shock is studied by employing large scale one-dimensional particle-in-cell (PIC) simulations in the de-Hoffmann and Teller (dHT) frame of reference. We demonstrate that diffusive shock acceleration of both electrons and ions occurs in quasi-perpendicular shocks configurations at large Alfvén Mach numbers. We also identify the role of precursor waves on the electron energization in the upstream region. The emergence of a significant non-thermal ion component holds important implications for observations of hadronic emission from collisionless shocks occurring for example in supernova remnants, and colliding stellar winds.

Keywords

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Collaboration

other Collaboration

Subcategory

Theoretical Results

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