

THE INTERACTIONS BETWEEN ALFVEN WAVES AND PERPENDICULAR SHOCKS

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Two-dimensional (2-D) hybrid simulations are performed to investigate the interactions between Alfven waves and perpendicular shock self-consistently. In hybrid simulations, ions are treated as particles and electrons are considered as massless fluid. The shock is formed by reflecting the particles in the right boundary, and the Alfven waves are injected from the left boundary. Part of the ions in the upstream can be reflected by the perpendicular shock, and are then energized by the motional electric field in the shock. Therefore, these ions have large temperature anisotropy immediate downstream of the shock, which can excite ion cyclotron waves. We discuss the transmission and enhancement of the upstream Alfven waves through the shock, and their influences on the ion cyclotron waves. Their possible effects on particle acceleration by the shock are also investigated.

Alfven waves, perpendicular shock, hybrid simulations, ion cyclotron waves.