Abstract Submitted
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Kinetic Alfvén Waves in three-dimensional magnetic reconnection[1] YU LIN, Physics Department, Auburn University, JI LIANG, School of Physics and Optoelectronic Technology, Dalian University of Technology, JAY JOHNSON, Andrews University, XUEYI WANG, Physics Department, Auburn University — Alfvénic waves are believed to be fundamentally important in magnetic reconnection. In this work, the generation and signatures of kinetic Alfvén waves (KAWs) associated with magnetic reconnection in a current sheet is investigated using a three-dimensional (3-D) hybrid code under a zero or finite guide field. In order to understand the wave structures in the general cases of multiple X-line reconnection, cases with a single X-line of various lengths are examined. KAWs with perpendicular wave number $k_\perp \rho_i \sim 1$ (with ρ_i being the ion Larmor radius) are found throughout the transient plasma bulge region and propagate outward along magnetic field lines with a super-Alfvénic velocity. These KAWs, which coexist with the whistler structure of the ion diffusion region, are generated from the X-line and propagate along field lines, carrying parallel electric field and Poynting fluxes. The structure, energy, and damping of the KAWs are examined.

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