Reconnection and Alfvén waves

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Reconnection is a very dynamic process in which efficient energy conversion from magnetic field energy into the kinetic energy of ions and electrons is taking place over large volumes. The reconnection region is associated with generation of different kind of plasma waves, high frequency Langmuir waves, whistlers, drift lower hybrid waves, etc.

Here we describe the ways Alfvén waves, particularly kinetic Alfvén waves, are generated in the reconnection region and what is their role in the reconnection process. We look both at the regions far from the X-line with well developed plasma jets and regions close to the X-line. We show examples from Cluster observations at the magnetopause, in the cusp and in the magnetotail.