Electron Acceleration in Collisionless Reconnection

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Abstract

Magnetic reconnection is a fundamental plasma process which rapidly converts magnetic energy into plasma kinetic energy, and it is considered to be related to many explosive phenomena in space and laboratory plasma, such as solar flares in the corona, the heating of solar corona, substorms in the Earth's magnetosphere, and disruptions in laboratory fusion experiments. There is observational evidence that a significant portion of the magnetic energy released during reconnection is converted into kinetic energy of energetic electrons, and the electron acceleration is one of the important signatures in magnetic reconnection. In this talk, we will review the recent progresses on electron acceleration in magnetic reconnection, and discuss the mechanisms of electron acceleration in the vicinity of X line, the separatrix region of magnetic reconnection, as well as during the interactions between magnetic islands.