Energetic Electron Acceleration in Unconfined Reconnection Jets

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Magnetic reconnection in astronomical objects such as solar corona and the Earth’s magnetotail theoretically produces a fast jet toward the object (known as a confined jet as it connects to the object through magnetic field lines) and a fast jet departing the object (known as an unconfined jet as it propagates freely in space). So far, energetic electron acceleration has been observed in the confined jet but never in the unconfined jet, arousing a controversy about whether or not reconnection jets can intrinsically accelerate electrons. Our study is focused on the electron acceleration in unconfined reconnection jet based on Cluster observations and VPIC simulations.