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Evidence of transient reconnection in the outflow jet of primary reconnection

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New investigations have provided the first observational evidence of secondary reconnection in the earthward outflow jet of primary reconnection in the magnetotail. It takes place 38 c/ωpi and further away from the primary reconnection site and results in the birth of a magnetic flux rope. The observations resemble recent numerical simulations where magnetic reconnection could spontaneously and transiently happen in the outflow jet, called secondary reconnection, and produces an asymmetric flux rope leading to the formation of a dipolarization front. The roles of secondary reconnection in energy conversion, dynamics of magnetotail, and substorms are discussed as well.