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Energy exchange between accelerated electrons and protons in an RCS with variable electric field

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Particle acceleration in a reconnecting current sheet (RCS) with variable electric field is discussed taking into account the collective electric field effects for fully or partially separated electron and proton beams. For fully separated beams the effects by the electric field induced across and RCS are evaluated for different magnetic field parameters and an RCS thickness. For partially separated beams the energy transfer from the driving beam to the trailing one is also estimated in a wake field accelerator. The effect of a collective electric field on the particle energy spectra at ejection from an RCS is also discussed.