Non-stationary MHD reconnection: numerical simulation of dependence with current sheet parameters.

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This work presents the results of the MHD simulation of non-stationary reconnection in a plain finite-width initial current sheet. Dependence of reconnection features, like the propagation velocity of the field reversal region, on current sheet thickness, mass density, and dissipative electric field duration is examined. As expected, forefront of the field reversal region propagates with a local Alfven velocity, whereas its mass velocity and back front velocity are less and depends on current sheet density and duration of dissipative electric field pulse. Obtained results can be used for the solution of the corresponding inverse problem, that is, reconstruction of the magnetotail reconnection parameters from the disturbances in the surrounding media, produced with nightside flux transfer events. Currently available inverse problem solutions (T.Penz et al, 2005) using field reversal region propagation as a model of nightside flux transfer events imply strong simplifications, like zero width of initial current sheet and Alfvenic velocity of disturbances. Improving of this analytical method is possible through the determination of additional parameters of the analytical model on the basis of the present numerical simulation result. The simulations are performed using a new MHD solver, which has been benchmarked using a set of standart tests (Brio-Wu test and Orszag-Tang vortex test).