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Retreat of X-line

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he X-line retreat problem is investigated by two-dimensional two-fluid simulations including finite electron inertia. Fast plasma flows, so called reconnection jet, are generated in the reconnection process. TanDokoro and Fujimoto [GRL 2005] reports from three-dimensional MHD simulations an interesting structure emerging at the leading part of a reconnection jet when the jet collides with the current sheet plasma at rest sitting ahead of the jet. The essence of this issue lies in the fact that the reconnection jet collides with the obstacle ahead of it. Now let us consider a case where the obstacle sits rather close to the origin of the jet (X-point). In this case one would think that the collision between the jet and the obstacle would have some affects on the process right at the X-point. Since resolving the process at the X-point requires electron scales to included, we have performed two and half dimensional Hall-MHD simulations including finite electron mass to investigate this problem. To simplify the problem, the initial seed of the X-point is set close one of the boundaries of the simulation box, and the symmetric boundary condition is adopted at the boundary. The boundary would act as a hard wall to the jet directed in this way. The boundary on the other side is taken to be the free boundary. With this asymmetric condition for the reconnection jet, we find that the X-point goes away from the hard-wall boundary as reconnection develops. The asymmetry of the inflow toward the X-point is also observed. In this paper, we will discuss the relationship between the plasma flows and the movement of the X-point.