

## M20a Reconnection enhancement in 3D evolution of a current sheet

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Magnetic reconnection is thought to explain various energy release astronomical activities. But how to reach fast reconnection remains unsolved. In our previous study, we noticed that when multiple tearing layers coexist in the same sheared current sheet, inflow and outflow of diffusion regions on different tearing layers couple with each other and trigger fast overall reconnection.

In order to have a clear picture of the reconnection enhancement, we simplify the initial condition by perturbing a sheared magnetic field with a pair of rotational-symmetric tearing instabilities. We notice that when new tearing layers are activated near the boundary of current sheet, the total reconnection is boosted accordingly. The new tearing layers are mediated by the inner modes that an increase of wavenumber along global guide field is observed. It guarantees a local fast reconnection due to the shorter tearing wavelength. Interactions between tearing layers, which are similar to what we identified in the previous study, are always observed. As a result, magnetic field is transported into the current sheet continuously and participate into global reconnection while reconnection rate is enhanced step-likewise.