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Gyrokinetic simulations of magnetic reconnection BARRETT ROGERS, PAOLO RICCI, Dartmouth College, TOMO TATSUNO, WILLIAM DORLAND, University of Maryland — We present nonlinear gyrokinetic simulations of magnetic reconnection in the presence of a strong guide field. The simulations are based on the GS2 code and explore reconnection in a simple collisionless two-dimensional periodic slab geometry. The GS2 code treats both the electrons and the ions gyrokinetically, and includes effects such as trapped particles and out-of-plane magnetic field perturbations due to finite plasma beta. The linear and nonlinear gyrokinetic results are compared to two-fluid and particle simulations of the same system, and the linear growth rates are benchmarked against various analytic calculations. Important effects to be addressed include the dependence of the reconnection rate on the ion-to-electron temperature ratio, the plasma beta, the simulation box geometry, as well as the electron/ion energy branching ratio.

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