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Gyrokinetic simulations of 2D magnetic reconnection turbulence in guide fields P.W. TERRY, M.J. PUESCHEL, University of Wisconsin-Madison, F. JENKO, Max-Planck-Institut fur Plasmaphysik, E. ZWEIBEL, V. ZHDANKIN, University of Wisconsin-Madison, D. TOLD, Max-Planck-Institut fur Plasmaphysik — Following the analyses in [M.J. Pueschel et al., Phys. Plasmas **18**, 112102 (2011)], a study of turbulence in driven reconnection is commenced, with a sinusoidal current sheet providing the drive through a Krook-type operator in a bi-periodic box. Simulations with the Gene code cover all relevant physical parameters, allowing for encompassing comparisons with expectations from linear simulations. A central observed feature are coherent circular current structures which may be identified as plasmoids. These objects move randomly in the plane perpendicular to the guide field, and may either disappear again after some time or instead merge with one another—the setup can thus be described as turbulence driven by reconnection, but simultaneously creating its own reconnection. Such merger events are associated with large bursts in the heating rate $j_\parallel E_\parallel$, and display strong non-Maxwellian components of the distribution function in parallel velocity space. The plasmoid energetics are studied, as are their ability to produce populations of fast particles. Statistics of such populations are used to facilitate direct comparisons with astrophysical scenarios of energetic particle production.

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