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Efficient Particle Acceleration in Highly-Magnetized Kink-Unstable Jets.[1] FREDERICO FIUZA, E. PAULO ALVES, SLAC - Natl Accelerator Lab — Relativistic jets from active galaxies are among the most powerful cosmic particle accelerators. It is thought that MHD instabilities, such as kink modes, can play an important role in the dissipation of the jet's copious magnetic energy. By using large-scale 3D particle-in-cell simulations we explore particle acceleration for extreme magnetizations associated with force-free equilibria. We find that magnetic reconnection is important in pre-accelerating thermal particles to gyroradius comparable to the plasma skin depth. This allows particles to experience the magnetic field curvature associated with the nonlinear development of the kink instability. We find that once particles are injected they can be efficiently accelerated by the combination of a large-scale coherent electric field and turbulence magnetic fields, with curvature drifts mediating the acceleration, similarly to what was observed in pressure-supported jets [1]. The non-thermal particles develop a power-law energy spectrum with an index that approaches ˜1.75 for high-magnetizations and carry away the majority of the initial toroidal magnetic field energy, establishing the kink instability as an efficient mechanism to trigger the conversion of the jet's magnetic energy in accelerated particles. [1] E. P. Alves, J. Zrake, F. Fiuza, Phys. Rev. Lett. **121**, 245101 (2018)

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