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**Reconnection and high energy radiation in the outer magnetospheres of gamma-ray emitting pulsars** HAYK HAKOBYAN, Princeton University, ALEXANDER PHILIPPOV, CCA, Flatiron Institute, ANATOLY SPITKOVSKY, Princeton University — Gamma-ray pulsars are thought to produce high energy photons in the outer magnetosphere close to the light cylinder via synchrotron radiation from nonthermal particles sustained in the current sheet. Magnetic reconnection near the Y-point is an efficient mechanism for tapping the magnetic field energy and accelerating particles that can later radiate synchrotron photons. The presence of a substantial density of high energy photons close to the current sheet can make two-photon pair production an efficient source of additional plasma loading in the outer magnetosphere. We present the results of particle-in-cell simulations of relativistic magnetic reconnection with self-consistent pair production. Radiation from accelerated particles in the current sheet produces secondary pairs in which are advected into the current sheet where they are reaccelerated and produce more photons. We study how the inflow of the secondary plasma, with multiplicities up to a several hundred, reduces the effective magnetization of the current sheet, suppressing the acceleration in the sheet and driving the system to a self-regulated regime. Our results offer an explanation for the weak dependence observed by Fermi Observatory of the gamma-ray cutoff in pulsars on the magnetic field at the light cylinder.

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