Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Relativistic reconnection in near critical Schwinger field KEVIN SCHOEFFLER, THOMAS GRISMAYER, GoLP/Instituto de Plasmas e Fusao Nuclear, Universidade de Lisboa, RICARDO FONSECA, DCTI/ISCTE Instituto Universitario de Lisboa, LUIS SILVA, GoLP/Instituto de Plasmas e Fusao Nuclear, Universidade de Lisboa, DMITRI UZDENSKY, Center for Integrated Plasma Studies, Physics Department, University of Colorado — Magnetic reconnection in relativistic pair plasma with QED radiation and pair-creation effects in the presence of strong magnetic fields is investigated using 2D particle-in-cell simulations. The simulations are performed with the QED module [1] of the OSIRIS framework that includes photon emission by electrons and positrons and single photon decay into pairs (nonlinear Breit-Wheeler). We investigate the effectiveness of reconnection as a pair- and gamma-ray production mechanism across a broad range of reconnecting magnetic fields, including those approaching the critical quantum (Schwinger) field, and we also explore how the radiative cooling and pair-production processes affect reconnection. We find that in the extreme field regime, the magnetic energy is mostly converted into radiation rather than into particle kinetic energy. This study is a first concrete step towards better understanding of magnetic reconnection as a possible mechanism powering gamma-ray flares in magnetar magnetospheres [2] [1] T. Grismayer et al., Physics of Plasmas 23, 056706 (2016) [2] D.A. Uzdensky, Space Science Reviews 160, 45-71 (2011)

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Date submitted: 14 Jul 2017 Electronic form version 1.4