Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Binary black hole mergers in magnetized disks: simulations in full general relativity ROMAN GOLD, University of Illinois at Urbana-Champaign, BRIAN FARRIS, University of Illinois at Urbana-Champaign, New York University, Columbia University, VASILEIOS PASCHALIDIS, ZACHARIAH ETIENNE, STUART SHAPIRO, University of Illinois at Urbana-Champaign — We present results from the first fully general relativistic, magnetohydrodynamic (GRMHD) simulations of an equal-mass black hole binary (BHBH) in a magnetized, circumbinary accretion disk. We simulate both the pre and post-decoupling phases of a BHBH-disk system and both "cooling" and "no-cooling" gas flows. Prior to decoupling, the competition between the binary tidal torques and the effective viscous torques due to MHD turbulence depletes the disk interior to the binary orbit. However, it also induces a two-stream accretion flow and mildly relativistic polar outflows from the BHs. Following decoupling, but before gas fills the low-density 'hollow' surrounding the remnant, the accretion rate is reduced, while there is a prompt electromagnetic (EM) luminosity enhancement following merger due to shock heating and accretion onto the spinning BH remnant. This investigation, though preliminary, previews more detailed GRMHD simulations we plan to perform in anticipation of future, simultaneous detections of gravitational and EM radiation from a merging BHBH-disk system.

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Date submitted: 10 Jan 2013 Electronic form version 1.4