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Robust GRMHD Evolutions of Merging Black-Hole Binaries in Magnetized Plasma[1] BERNARD KELLY, CRESST/UMBC/GSFC, ZACHARIAH ETIENNE, West Virginia University, BRUNO GIACOMAZZO, University of Trento, JOHN BAKER, NASA GSFC — Black-hole binary (BHB) mergers are expected to be powerful sources of gravitational radiation at stellar and galactic scales. A typical astrophysical environment for these mergers will involve magnetized plasmas accreting onto each hole; the strong-field gravitational dynamics of the merger may churn this plasma in ways that produce characteristic electromagnetic radiation visible to high-energy EM detectors on and above the Earth. Here we return to a cutting-edge GRMHD simulation of equal-mass BHBs in a uniform plasma, originally performed with the Whisky code [Giacomazzo et al., ApJ 752:L15 (2012)]. Our new tool is the recently released IllinoisGRMHD [Etienne et al., CQG 32:175009 (2015)], a compact, highly-optimized ideal GRMHD code that meshes with the Einstein Toolkit. We establish consistency of IllinoisGRMHD results with the older Whisky results, and investigate the robustness of these results to changes in initial configuration of the BHB and the plasma magnetic field, and discuss the interpretation of the "jet-like" features seen in the Poynting flux post-merger.

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