Modeling the Electromagnetic and Gravitational Radiation from Neutron Stars STEVEN LIEBLING, Long Island University, MATTHEW ANDERSON, Indiana University Bloomington, ERIC HIRSCHMANN, DAVID NEILSEN, Brigham Young University, CHAD HANNA, LUIS LEHNER, Perimeter Institute for Theoretical Physics, CARLOS PALENZUELA, CHRISTOPHER THOMPSON, Canadian Institute for Theoretical Astrophysics, PATRICK MOTL, Indiana University Kokomo — The dynamics of magnetized neutron stars both in binaries and in isolation are modeled with a novel numerical approach able to capture the dynamics of the star(s) and of the surrounding plasma. The stellar dynamics incorporate ideal MHD which appropriately models the regime in which the fluid pressure dominates that of the magnetic field, while the stellar exterior is modeled within the force free approach (magnetic pressure largely dominates that of the fluid). The approach is shown to approach certain known solutions. An intense electromagnetic outburst is observed for the collapsing, rotating star. The approach is also applied to the coalescence of a neutron star binary.

Steven Liebling
Long Island University

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