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Neutron Star - Magnetosphere Interactions MARCELO PONCE, Department of Physics, University of Guelph, Guelph, MATTHEW ANDERSON, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LUIS LEHNER, Perimeter Institute for the Theoretical Physics, Waterloo - Department of Physics, University of Guelph, Guelph, STEVEN L. LIEBLING, Department of Physics, Long Island University, New York, CARLOS PALENZUELA, Canadian Institute for Theoretical Astrophysics, Toronto — In this work we report results of the interaction of a neutron star magnetosphere in both collapsing and moving scenarios interacting with an ambient magnetic field. In recent works [1,2], it has been shown the important role and realism associated with studies of electromagnetic environments in some particular regimes, such as: ideal-MHD, force-free, and electro-vacuum. Motivated by this and their astrophysical implications for BBH and hybrid BH-NS mergers [3,4], we study the following cases: collapse of a magnetized NS, head-on collision of a BH-NS, and orbiting merger of a BH-NS. Based in the results from our simulations, we draw some relevant conclusions to the production of jets as described within the force-free formalism.

- [1] C.Palenzuela, L.Lehner and S.Liebling, *Science* **329**, 927 (2010).
- [2] C.Palenzuela, T.Garrett, et al., *Phys.Rev.D* **82**, 044045 (2010).
- [3] L.Lehner, C.Palenzuela, et al., 2011.
- [4] S.Liebling, L.Lehner, et al., *Phys.Rev.D* **81**, 124023 (2010).

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