Spritz: General Relativistic Magnetohydrodynamics with Neutrinos[1] FEDERICO CIPOLLETTA, Rochester Institute of Technology, THEORETICAL AND COMPUTATIONAL ASTROPHYSICS NETWORK ON BINARY NEUTRON STARS TEAM[2] — I will present our new GRMHD code aimed at the study of compact binary mergers with finite-temperature equations of state and neutrino physics that is already available for public download. Numerical modeling of NS-NS and NS-BH binary mergers requires a fully general relativistic treatment taking into account accurate magnetic field's evolution and microphysics effects, to extract the most complete physical information from gravitational waves and electromagnetic signals observed. I will summarize the main features of our code, namely: the evolution of a staggered vector potential that automatically satisfies the magnetic field's divergence-free condition; the general treatment for the NS Equation Of State allowing for the use of either analytical or tabulated one; a neutrino leakage scheme that provides a useful tool for the study of the post-merger phase. I will present the tests that we performed, including TOV taking into account electron fraction evolution, temperature effects, neutrino leakage, and magnetic field. I will also show preliminary results obtained by the Spritz code in simulating BNS mergers with tabulated EOS within the collaboration funded by the NASA TCAN 80NSSC18K1488 grant.

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