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Mass ejection from black hole-neutron star binaries KOUTAROU KYUTOKU, University of Wisconsin-Milwaukee, KUNIHITO IOKA, KEK (High Energy Accelerator Research Organizaion), MASARU SHIBATA, Kyoto University — Black hole-neutron star binaries are ones of the most promising sources of gravitational waves for upcoming second-generation detectors. To confirm gravitational-wave detection and obtain as much information as possible, it is desirable to observe electromagnetic counterparts simultaneously. It has been pointed out by many authors that various electromagnetic signals are reasonably expected if substantial material is ejected during the binary merger. One plausible mechanism of mass ejection from black hole-neutron star binaries is tidal disruption of neutron stars by the tidal force exerted by black holes. A quantitative study of this dynamical mass ejection requires numerical-relativity simulations. We perform simulations of black hole-neutron star binaries focusing on the dynamical mass ejection for a range of binary parameters including equations of state of neutron star matter. We present important results such as masses and velocities of ejecta obtained by our simulations, and also discuss possible characteristics of electromagnetic counterparts to black hole-neutron star binaries. In particular, we focus on anisotropy and bulk velocity (i.e., the velocity component other than the expansion velocity) of the ejecta, and electromagnetic features resulting from them.

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