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**Simulations for the merger of black hole-neutron star binary in full general relativity.**[1] KOJI URYU, University of Wisconsin-Milwaukee, MASARU SHIBATA, University of Tokyo — Simulations for the merger of black hole-neutron star (BH-NS) binary are performed successfully in full general relativity, starting from the initial data in quasi-equilibrium circular orbit. A new method is developed for calculating the puncture BH-NS initial data in circular orbits. Then, the BH-NS binary is evolved using the moving puncture method. For the initial data, we assumed that the BH has no spin, while the NS has the corotating velocity field and follows the $\Gamma$-law equations of state with $\Gamma = 1$. The BH mass is chosen to be $M_{\rm BH} \approx 3.2 M_\odot$, and the NS mass to be $M_{\rm NS} \approx 1.4 M_\odot$ with relatively large radius $\sim$ 14km. It is found that the neutron star is tidally disrupted near the last orbit, $\sim$ 80% of the NS mass is swallowed into the BH, and the disk mass after the merger in this model is estimated as small as $\sim 0.3 M_\odot$. The result indicates that the BH-disk system with the disk mass $\sim M_\odot$ is not formed after the merger of non-spinning BH and NS binary, although a disk of mass $\sim 0.1 M_\odot$ is a possible outcome.

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