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Binary strange quark star merger in fully general-relativistic simulation

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Numerical simulations of strange quark stars (QSs) are challenging due to the strong density discontinuity at the stellar surface. This issue becomes even more problematic in merger scenarios, as any ejected strange matter droplets also exhibit discontinuous density surfaces. In this work, we perform general-relativistic simulations of binary QS merger and observe the formation of spiral arms in the post-merger phase, with densities comparable to the central densities of the stars. Such behavior has not been observed in previous QS merger simulations that employ a smooth density tail to handle the density discontinuity at the star surface. We also extract the emitted gravitational wave signals and compare with those from binary neutron star mergers.

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