Low mass binary neutron star mergers : gravitational waves and neutrino emission FRANCOIS FOUCART[1], Lawrence Berkeley National Laboratory, SXS COLLABORATION COLLABORATION — We present numerical simulations of low mass binary neutron star mergers ($1.2 M_\odot - 1.2 M_\odot$) with the SpEC code for a set of three nuclear-theory based, finite temperature equations of state. The merger remnant is a massive neutron star which is either permanently stable or long-lived. We focus on the post-merger gravitational wave signal, and on neutrino-matter interactions in the merger remnant. We show that the frequency peaks of the post-merger gravitational wave signal are in good agreement with predictions obtained from simulations using a simpler treatment of gravity. We then estimate the neutrino emission of the remnant using a neutrino leakage scheme and, in one case, compare these results with a gray two-moment neutrino transport scheme. We confirm the complex geometry of the neutrino emission, also observed in previous simulations with neutrino leakage, and show explicitly the presence of important differences in the neutrino luminosity, disk composition, and outflow properties between the neutrino leakage and transport schemes. We discuss the impact of our results on our ability to measure the neutron star equation of state, and on the post-merger electromagnetic signal and r-process nucleosynthesis in neutron star mergers.

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