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Measuring Ejecta from Inspiralling Binary Neutron Stars using Smoothed-particle Hydrodynamics[1] MONICA RIZZO, RICHARD O'SHAUGHNESSY, JOSHUA FABER, Rochester Institute of Technology — Gravitational waves, detectable perturbations in spacetime, can arise from astrophysical systems such as inspiralling binary neutron stars, the remnants of the core collapse of massive stars. In the inspiral process, neutron stars, composed of highly dense nuclear matter, are torn apart by each others gravity and eject matter. Using both gravitational waves and direct observations of ejected matter, we may gain valuable new information about the composition of neutron stars. Using several previously studied test cases, we seek to determine how the amount of ejected matter depends on the physical parameters of these systems. To do this, we use a particle-based hydrodynamics code which can accurately simulate binary neutron star systems with variable equation of state, spin, mass ratio, and eccentricity, and includes the lowest-order effects from gravitational wave emission.

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