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New Approach for Initial Data of Compact Object Binaries MICHAEL CLARK, PABLO LAGUNA, Georgia Inst of Tech — We present a new construction for initial data for simulations of binary systems with neutron stars. This method generalizes the Bowen-York extrinsic curvature for puncture black holes to TOV model stars while still satisfying the momentum constraint. We use this construction to generate binary systems involving neutron stars, using post-Newtonian approximations to compute the necessary momenta for the objects given the mass ratio, separation, and spins. We compare fully evolved simulations using this data to other systems in the literature, for double neutron star binaries and mixed black hole/neutron star binaries, with and without spin. We also analyze the oscillation modes of a single neutron star generated by this data.

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