Signatures of the random singlet phase after a bond-breaking
COURTNEY LANERT, Wellesley College, GIL REFAEL, California Institute of Technology — We study the time evolution of one-dimensional hardcore bosons, initially prepared in a state with random nearest-neighbor hopping, after the severing of one nearest-neighbor bond. The initial system is equivalent to an $xy$ spin chain with random nearest-neighbor bonds and displays a random singlet phase. Analytic results are demonstrated with exact numerical time-evolution of finite-sized systems. The correlations between pairs of sites in the time-evolving system after a single bond is broken display signatures of the critical phase as well as evidence of the “light cone” effect as information about the broken bond moves through the system.