Distinguishing GRB progenitors: An application of Maximum Entropy Gravitational-wave Data Analysis[1] RUXANDRA BONDARESCU, RAVI KUMAR KOPPARAPU, LEE SAMUEL FINN, Pennsylvania University, TIFFANY SUMMERSCALES, Andrews University — What are the progenitors of short duration Gamma Ray Bursts (GRBs)? Theory predicts a variety of short GRB models with Neutron Star - Neutron Star binary mergers and the tidal disruption of a neutron star by a black hole being the most favored scenarios. Will the emitted gravitational radiation help in distinguishing between different types of progenitors? Can the gravitational radiation emitted by a long duration GRB source be confused with that from a short GRB source? How do we differentiate between the different sources in noisy detector data? To answer some of these questions, we use maximum entropy analysis for a network of gravitational-wave detectors, such as LIGO or VIRGO, and recover simulated burst waveforms from noisy data. The efficiency with which we recover the waveforms is computed by cross-correlating with simulated core-collapse and merger waveforms. We also estimate how strong a gravitational-wave signal needs to be, before we can distinguish between different types of progenitors.

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