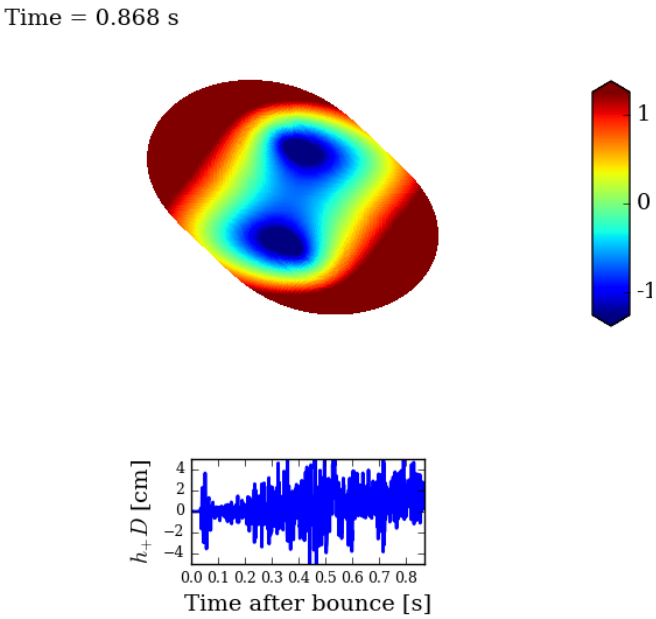
Temporal and Angular Variations of 3D Core-Collapse Supernova Emissions and their Physical Correlations

Objectives

To determine the correlations between CCSN neutrino and gravitational wave emissions and physical phenomena in the supernova core.

Impact

An analysis of the neutrino and GW emissions from a CCSN can speak volumes concerning the internal dynamics of the supernova itself.



Accomplishments

We provide time series and angular distributions of the neutrino and GW emissions of eleven state-of-the-art 3D CCSN models and explore correlations between these signatures and the real-time dynamics of the shock and the proto-neutron-star core. For our entire set of 3D models, we find strong connections between the cumulative neutrino energy losses, the radius of the proto-neutron star, and the f-mode frequency of the gravitational wave emissions.

Citation: Vartanyan et al. MNRAS, in press, 2019 (arXiv:1906.08787) Contact : David Vartanyan (Princeton)