

Gravitational wave signature from the high-density regime of core-collapse supernovae

Certain features of the gravitational wave spectrogram from core-collapse supernovae are the imprint of excited oscillation modes of the dense proto-compact star, excited by various manifestations of asymmetric fluid motion. One of the most robust signal components arises from a quadrupolar f/g -mode whose frequency increases from a few hundred Hz to above 1 kHz. In addition, another distinct quadrupolar g -mode at frequencies in the dHz range appears even further inside, at several times nuclear saturation density, whose frequency decreases. I will present the physical origin of this core g -mode, its potential to constrain the speed of sound in the QCD phase diagram, and curious features, such as its absence in our 3D simulations and reasons behind its frequency-decreasing behavior.

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