

Abstract Submitted  
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**Equation of State Dependence of Gravitational Waves from Rapidly Rotating Core-Collapse** SHERWOOD RICHERS, CHRISTIAN D. OTT, Caltech, ERNAZAR ABDIKAMALOV, Nazarbayev University — We carry out axisymmetric simulations of rotating core-collapse, exploring over 92 precollapse rotational configurations and 18 different finite-temperature microphysical equations of state (EOS) using the general-relativistic hydrodynamical code CoCoNuT. Our focus is on gravitational wave (GW) emission. We find that the GW wave signature depends systematically on the rotation rate of the inner core at bounce and the compactness of the protoneutron star (PNS), set by the EOS and rotation. The GW signal from core bounce is almost independent of the EOS. However, the frequency of the post-bounce ring down signal from the fundamental quadrupole oscillation mode of the PNS is dependent on both rotation and the EOS, increasing with rotation rate and compactness. We will discuss the origin of the EOS-dependent f-mode frequency variation and its potential observability with Advanced LIGO.

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