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The Gravitational Wave Signal from Core-Collapse Supernovae VIKTORIYA GIRYANSKAYA (MOROZOVA), Princeton University, DAVID RADICE, Princeton University, Institute for Advanced Study, ADAM BURROWS, DAVID VARTANYAN, Princeton University — The ground-based laser interferometers LIGO and Virgo have recently detected the gravitational-wave signal of merging binary systems of black holes and neutron stars. Detection of the gravitational waves from a galactic core-collapse supernova, potentially accompanied by detection of neutrinos and electromagnetic observations in all available bands, could be the next major breakthrough. In this talk, I will present gravitational waves from a set of two-dimensional multi-group neutrino radiation hydrodynamic simulations of core-collapse supernovae. I will demonstrate that starting from $\sim$400 ms after core bounce the dominant gravitational-wave signal comes from the fundamental quadrupole (l = 2) oscillation mode (f-mode) of the proto-neutron star. In addition, I will summarize the dependence of the dominant gravitational-wave frequency on the progenitor mass, equation of state, many-body corrections to the neutrino opacity, and rotation.

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