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The Effects of Superfluidity on the Oscillation Modes of Compact Stars.[1] RAPHAEL MONROY, PRASHANTH JAIKUMAR, Cal State Univ-Long Beach — Theoretical models suggest that the nucleons in a neutron star can form a superfluid, given that the neutron star temperature (at 10^6 Kelvin) is below the critical temperature (at 10^9 Kelvin) for pair formation via the strong nuclear force. While the superfluid is not directly observable, it affects the oscillation modes of the star. We use a numerical model taking into account the superfluidity and general relativity, and identify imprints of the superfluid state. Though the modes cannot be observed with current technology, increasing the sensitivity of the Laser Interferometer Gravitational-Wave Observatory (LIGO) could allow us to compare calculated modes with observations to determine a realistic model of the interior of neutron stars.

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Raphael Monroy
Cal State Univ- Long Beach

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