

Fundamental oscillation modes of self-interacting bosonic dark stars

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We perform a detailed analysis of the fundamental f -mode frequencies and damping times of nonrotating stellar-mass boson stars in general relativity by solving the nonradial perturbation equations. Two parameters which govern the microscopic properties of the bosonic condensates, namely the self-coupling strength and the mass of the scalar particle, are explored. These two quantities characterize oscillations of boson stars. Specifically, we reexamine some empirical relations that describe the f -mode parameters in terms of the mass and radius of boson stars.