Gravitational wave imprints of bosonic dark matter fields

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In the past years, numerous evidences of the existence of dark matter in the Universe have been discovered. Because dark matter interacts feebly with the baryonic sector, a direct observation with standard telescopes seems to be hopeless. However, within the advent of the gravitational wave astronomy, signatures of dark matter environments may appear in the gravitational wave signals through dynamical processes, such as binaries moving through a dark matter medium. Nonetheless, some works suggest that dark matter compact configurations can be formed in a reasonable time, being possible candidates for the supermassive configurations in the center of the galaxies. We explore the gravitational phenomena associated to a particular kind of dark matter, namely a bosonic dark matter described by a massive and self-interacting scalar field. We study compact objects, known as boson stars, computing their quasinormal modes, and analyzing the gravitational wave signatures of binaries in the extreme mass-ratio regime. Additionally, we explore possible effects of the motion of compact stars through a dark matter medium.