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Gravitational wave asteroseismology of charged strange stars in the Cowling approximation

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In this work we study, within the framework of Cowling approximation, the effect of the electric charge on the gravitational wave frequency of fluid oscillation modes of strange quark stars. For this purpose, the dense matter of the stellar fluid is described by the MIT bag model equation of state (EoS), while for the electric charge profile, we consider that the electric charge density is proportional to the energy density. We find that the gravitational wave frequencies change with the increment of electric charge; these effects are more noticeable at higher total mass values. We obtain that the f -mode is very sensitive to the change in the electric charge of the star. Furthermore, in the case of the p_1 mode, the effect of the electric charge is not very significant. Our results reveal that the study of the fundamental pulsation mode of an electrically charged compact star is very important to distinguish whether compact stars could contain electric charge.

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