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Properties of strange mesons in dense resonance matter

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Exploring the in-medium properties of different mesons such as their masses and decay width may play a significant role in understanding the related experimental observables. In this work we focus on the modifications in the properties of pseudoscalar K and vector ϕ mesons in the dense hadronic medium using the chiral SU(3) hadronic mean field model. We consider the hadronic medium consisting of nucleons, hyperons and decuplet baryons at finite density and temperature. In the chiral SU(3) model, the properties of baryons are modified through the exchange of scalar fields σ, ζ and δ and vector fields ω, ρ and ϕ. We evaluate the in-medium masses and optical potentials of K mesons at finite baryon density and temperature. Considering the in-medium masses of K mesons as input, masses and decay width of ϕ mesons are evaluated using the effective Lagrangian approach through the $\phi K \bar{K}$ interactions at one-loop level. Finite temperature of the resonance matter is found to impact significantly the in-medium masses of different mesons.

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