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Effective Lagrangians and thermal resonances under extreme conditions

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Abstract

We analyze various problems related to the physics of hadrons under extreme conditions of temperature and chemical potentials. On the one hand, we show that the thermal resonances $f_0(500)$ and $K_0^{*}(700)$, generated in the framework of Unitarized Chiral Perturbation Theory $\pi\pi$ and $K\pi$ scattering at finite temperature, play an essential role concerning chiral and $U(1)_A$ restoration. On the other hand, a low-energy effective Lagrangian has been constructed within ChPT at non-zero chemical potential, which we discuss here for an axial chemical potential.

