

Properties of Mesons in a Dense and Hot Medium

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In this work, we investigate the combined effects of temperature, external magnetic field and finite size of the system on the properties of neutral mesons in a dense and hot medium, in the context of the Nambu-Jona-Lasinio (NJL) model. In particular, we use the mean-field approximation, Schwinger's proper time method and the Matsubara series treated through the of Jacobi's theta functions, to study the chiral phase transition, the constituent quark mass and light neutral mesons under the change of the finite size of the system, temperature, chemical potential and strength of the external magnetic field. The studied phase diagrams indicate that the observables are strongly affected by these parameters, and that the net result will depend on the balance of these concurrent phenomena. Furthermore, they agree with others found in the literature described by different tools.

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