Seminar

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Thermal modification of heavy mesons below $T_c$ from an effective hadronic theory

We study the modification of heavy mesons in a hot pionic medium using a non-perturbative unitary approach based on an effective hadronic theory [1]. The interaction between the heavy mesons and pseudoscalar Goldstone bosons is described by a chiral Lagrangian at next-to-leading order in the chiral expansion and leading order in the heavy-quark mass expansion so as to preserve heavy-quark spin symmetry. The meson-meson scattering problem in coupled channels with finite-temperature corrections is solved in a self-consistent manner.

From the self-consistent unitarized scattering amplitudes at finite temperature, we calculate the self-energies and the spectral functions of the ground-state charmed mesons. We observe that the $D$ and $D_s$ mesons acquire a substantial width and their masses drop significantly with increasing temperatures. Similar thermal effects are found for the vectors $D^*$ and $D_s^*$. This implies a modification at $T > 0$ of the excited mesonic states, generated dynamically in our heavy-light molecular model, as the $D_0(2300)$ and $D_{s0}(2317)$.


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