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Strange tensor mesons decay constants at finte temperature

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Summary

Investigation of the thermal properties of the higher spin mesons is one of the important problems of the hadron physics. Theoretical calculations on the physical parameters of the tensor mesons and their comparison with experimental data could give essential information about their nature and it can also be useful for understanding of nonperturbative QCD dynamics. At finite temperature, the Lorentz invariance is broken by the choice of a preferred frame of reference and some new operators appear in the Wilson expansion. Taking into account these additional operators coming up at finite temperature, we calculate the thermal two-point correlation function for $D_2^*(2460)$ and $D_{s2}^*(2573)$ tensor mesons and obtain the QCD sum rules. In order to perform the numerical analysis, we use the fermionic part of the energy density obtained both from lattice QCD and Chiral perturbation theory. We also used the temperature dependent continuum threshold and we observed that the values of the decay constants decrease considerably near to the critical temperature comparing to their values in the vacuum. Our results at zero temperature are in good consistency with the existing experimental data as well as predictions of the other nonperturbative models.

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