

Thermal behavior of the axial vector coupling constant

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Abstract

A thermal QCD Finite Energy Sum Rule (FESR) allows us to obtain the temperature dependence of the axial vector coupling of the nucleon, $g_A(T)$. It turns out that this coupling is essentially constant for the wide range $0 \leq T \leq 0.9T_c$, being T_c the critical deconfining temperature. In contrast to other effective hadronic couplings, $g_A(T)$ diverges when $T \rightarrow T_c$. At finite temperature, g_A develops also a q^2 dependence. This led us to explore the mean squared radius associated to g_A , finding that it diverges at the critical temperature, thus signalling quark deconfinement. Finally, as a byproduct of our analysis, we study the thermal evolution of the Goldberger-Treiman relation