

Thermal Properties of Heavy-Light Quark Pseudoscalar and Vector Mesons

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Abstract

The thermal behaviour of the mass, leptonic decay constant, and width of heavy-light quark pseudoscalar and vector mesons is analyzed in the framework of thermal Hilbert moment QCD sum rules. In all the cases, the meson leptonic decay constants decrease with increasing T , and vanish at a critical temperature T_c , while the mesons develop a width which increases dramatically, diverging when $T \rightarrow T_c$, where T_c is the temperature for chiral-symmetry restoration. The spectral function becomes a smooth function of the energy. This is interpreted as a signal for deconfinement at $T = T_c$. In contrast, the thermal masses are stable, except when $T \rightarrow T_c$, where the pseudoscalar meson mass increases slightly by 10-20 %, and the vector meson mass decreases by some 20-30 %.