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Trace anomaly form factor of the pion and the nucleon from lattice QCD

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The trace of the energy momentum tensor (ETM) in the hadron gives the hadron mass. The trace anomaly due to the conformal symmetry breaking is believed to be an important ingredient for confinement. In this talk, I will show the trace anomaly form factors of the pion, nucleon and ρ meson as functions of the squared momentum transfer Q^2 up to ~ 4.3 GeV^2 which are calculated on a domain wall fermion (DWF) ensemble with overlap valence quarks at $m_\pi = 340$ MeV. We found a sign change behavior of the trace anomaly form factor of the pion. This is consistent with the sign change of the radial distribution of the trace anomaly matrix element in a recent lattice calculation.

Topical area

Structure of Hadrons and Nuclei

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