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Finite-energy sum rules at finite baryon chemical potential

QCD sum rules constitute a crucial framework for investigating hadronic and QCD properties and parameters both in vacuum and in-medium. Among the various types of sum rules available, finite energy sum rules (FESR) stand out as a valuable method for analyzing hadrons under extreme conditions, including high temperature, density, and strong electromagnetic fields.

Although sum rules are well established in vacuum, their in-medium formulation still involves subtleties that can be crucial for accurately describing in-medium parameters. Here, I will show how the model changes when incorporating two important elements: the so-called "scattering term" and the in-medium operator mixing arising from the "non-normal ordered quark condensate."

Accounting for these effects ensures the correct signs of condensates, reflects the QCD "silver blaze" property, and, at high chemical potential, captures the phenomenon of color superconductivity.

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