

The effects from higher order coupling of fluctuations of spin hydrodynamics in high energy heavy-ion collisions

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There is remarkable spin polarization phenomenon in the quark-gluon plasma produced in relativistic heavy ion collisions. The experimental detectable polarization of the vector mesons and spin polarization of the Λ hyperons provides important evidence for this spin polarization phenomenon. So far, there is still sign problem in theories to interpret the experimental results of local polarization. Recently, spin hydrodynamics is undergoing rapid development as a phenomenology framework to describe the spin polarization phenomenon. In order to describe spin polarization more accurately in the framework of spin hydrodynamics, the fluctuations and their higher order coupling effects may need a systematic discussion. We develop the spin hydrodynamics to including the higher order coupling of fluctuations, based on which we will use effective field theory method to study the physical effects induced by the coupling of spin fluctuations and hydrodynamic fluctuations, and to understand the relation between hydrodynamic fluctuations and spin diffusion more accurately and systematically.

Category

Theory

Collaboration

Authors: Prof. HUANG, Xu-Guang; YAN, Li (Fudan University); LIN, Shu; YANG, Lixin (Sun Yat-sen University)

Presenter: YANG, Lixin (Sun Yat-sen University)

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