Contribution ID: **667**   Type: **Poster**

Spin Alignment of Vector Mesons Induced by the Hydrodynamics Gradients

Friday 8 April 2022 14:32 (4 minutes)

The measurements of the spin observables open a new window for understanding the quantum properties of the hot and dense medium created in heavy-ion collisions. However, there are still several puzzling phenomena begging for satisfactory explanations. Particularly, the measured spin-alignments of the vector boson is unexpectedly large compared to a class of model calculations. To investigate this problem systematically, we employ the linear response theory formulated in work [1,2] to derive the induced spin-alignment (i.e. spin density matrix) of the vector mesons, such as phi-mesons, by the hydrodynamic gradients [3]. We obtain expressions on spin density matrix that are qualitatively different from those based on the coalescence model. We discuss phenomenological implication of our results.

Refs.

[1] Baochi Fu, Shuai.Y.F.Liu, Longgang Pang, Huichao Song and Yi Yin , "Shear-Induced Spin Polarization in Heavy-Ion Collisions", Phys. Rev. Lett. 127 (2021) 14, 142301.

[2] Shuai Y.F. Liu and Yi Yin , "Spin polarization induced by the hydrodynamic gradients", JHEP 07 (2021) 188.

[3] Feng Li, Shuai Y.F. Liu and Yi Yin, in prepration.

Authors: LI, Feng (Lanzhou University); LIU, Shuai (Institute of Modern Physics); YIN, Yi (Institute of modern physics, Chinese Academy of Sciencessti)

Presenter: LI, Feng (Lanzhou University)

Session Classification: Poster Session 3 T12_2

Track Classification: New theoretical developments