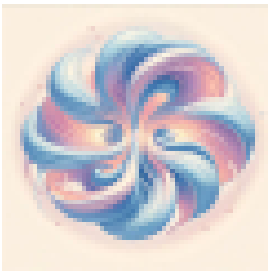

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Chiral Kinetic Theory in Curved Space Revisited and Radiative Corrections (online)

lundi 22 juillet 2024 16:30 (30 minutes)

It is usually believed that physics in off-equilibrium state can be equivalently studied using equilibrium state with suitable metric perturbation. We point out it is not the case for spin polarization phenomena: the exisiting chiral kinetic theory in curved space fails to recover all the couplings between spin and hydrodynamic gradients [1]. We present a new form of chiral kinetic theory in curved space, in which the equivalence is established [2]. The equivalence allows us to formulate spin polarization in hydrodynamic medium as a scattering problem, which is then studied using in-medium form factors [3,4]. We find radiative corrections to all couplings between spin and hydrodynamic gradients. Implications for local spin polarization of Lambda hyperon will be discussed.

[1] Y.-C. Liu, L.-L. Gao, K. Mameda and X.-G. Huang, Phys.Rev.D 99 (2019) 8, 085014
[2] J. Tian and S. Lin, to appear
[3] S. Lin and J. Tian, Acta Phys.Sin. 72 (2023) 7, 071201
[4] S. Lin and J. Tian, Eur.Phys.J.Plus 139 (2024) 2, 109

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