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Tensor polarization and spectral properties of vector meson in QCD medium

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We calculate the tensor polarization and the resulted spin alignment of a generic vector meson in local equilibrium up to the first order in hydrodynamic gradients using thermal field theory with dissipative effects incorporated. Several new contributions, including a novel shear-induced tensor polarization (SITP), are discovered and turn out sensitive to the in-medium spectral properties of the vector mesons. The phenomenological study reveals that these contributions, especially SITP, could generate substantial spin alignment in heavy-ion collisions, and potentially helps us to understand the large spin alignment observed in experiments. The talk will be mostly based on our work [1] with several updates on phenomenological implications.

[1]arXiv:2206.11890

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