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Quarkonium polarization in a vortical medium

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We examine in detail the mass, lifetime and spin structure of quarkonium in a rotating vortical medium, where the quark spin is not necessarily aligned with the vortex.
After justifying this set-up in terms of spin hydrodynamics, and outlining the expected dependence of spin and vorticity, we examine the mass, lifetime and spin density matrix of quarkonium.
Our analysis implies a novel distillation-based mechanism for spin-alignment generation (which could also apply to the phi if one considers it a quarkonium state) as well as experimental probes of spin-vorticity non equilibrium.

Based on arXiv:2305.02985

Category

Theory

Collaboration (if applicable)

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