

Quantum kinetic theory and collisional contributions to shear induced polarization

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We derive a quantum kinetic theory for QED based on Kadanoff-Baym equation. It generalizes the well-known classical kinetic theory to the polarized case, with spin polarization entering in the next order of gradient expansion. We also discuss generalization to QCD. We use this framework to study shear induced polarization for Lambda hyperon in heavy ion collisions. We find new collisional contributions to shear induced polarization coming from self-energy and gauge link respectively. The new contributions are parametrically the same as the one considered so far in the literature. They can lead to modest suppression of the shear induced polarization in phenomenological studies.

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