

Virtual photon polarization in ultrarelativistic heavy-ion collisions

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The polarization of direct photons produced in an ultrarelativistic heavy-ion collision reflects the anisotropy of the quark-gluon plasma created in the collision. We describe a general framework, based on the photon spectral functions in the plasma, for analyzing the angular distribution and thus the polarization of dileptons in terms of the plasma anisotropies. The rates of dilepton production depend in general on four independent spectral functions, corresponding to two transverse polarizations, one longitudinal polarization, and – in plasmas in which the anisotropy is not invariant under parity in the local rest frame of the matter – a new spectral function, ρ_n , related to the anisotropy direction in the collision. The anisotropy appears in the difference of the two transverse spectral functions, as well as in ρ_n . As an illustration we delineate the spectral functions for dilepton pairs produced in the lowest order Drell-Yan process of quark-antiquark annihilation to a virtual photon.

Preferred Track

Electromagnetic Probes

Collaboration

Not applicable

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