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Spin alignment from quantum kinetic theory

We derive an expression for the tensor polarization of a system of massive spin-1 particles in a hydrodynamic framework. Starting from quantum kinetic theory based on the Wigner-function formalism, we employ a modified method of moments which also takes into account all spin degrees of freedom. It is shown that the tensor polarization of an uncharged fluid is determined by the shear-stress tensor. In order to quantify this novel polarization effect, we provide a formula which can be used for numerical calculations of vector-meson spin alignment in relativistic heavy-ion collisions.

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