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Polarization transfer in hyperon decays and its effect in relativistic nuclear collisions

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We study the contribution to the polarization of Λ hyperons in relativistic nuclear collisions at high energy from the decays of $\Sigma^*(1385)$ and Σ^0, which are the predominant sources of Λ production besides the primary component, as a function of the Λ momentum. Particularly, we determine the longitudinal component of the mean spin vector as a function of the azimuthal angle and show that it has a very similar pattern to the primary one, if primary Σ^* and Σ^0 polarization follow the predictions of local thermodynamic equilibrium in a relativistic fluid. Therefore, we conclude that the secondary decays cannot account for the discrepancy between experimental data and hydrodynamic model predictions of the longitudinal polarization of Λ hyperons recently measured by the STAR experiment at RHIC.

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