Contribution ID: **341** Type: **Poster**

Hydrodynamics of spin currents

Friday 8 April 2022 14:36 (4 minutes)

We study relativistic hydrodynamics in the presence of a non vanishing spin chemical potential. Using a variety of techniques we carry out an exhaustive analysis, and identify the constitutive relations for the stress tensor and spin current in such a setup, allowing us to write the hydrodynamic equations of motion to second order in derivatives. We then solve the equations of motion in a perturbative setup and find surprisingly good agreement with measurements of global Λ-hyperon polarization carried out at RHIC.

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Session Classification: Poster Session 3 T12_1

Track Classification: New theoretical developments