

# Longitudinal spin polarization with dissipative corrections

*Wednesday 15 January 2025 14:55 (7 minutes)*

In this work, we address the problem of longitudinal spin polarization of  $\Lambda$  hyperons produced in relativistic heavy-ion collisions. We employ a relativistic kinetic theory framework that incorporates spin degrees of freedom treated classically, combined with the freeze-out parametrization used in previous investigations. This approach allows us to include dissipative corrections—stemming from thermal shear and gradients of thermal vorticity—into the Pauli-Lubanski vector, which determines spin polarization and can be directly compared with experimental data. As in similar studies, we find that successfully describing the data requires additional assumptions. In our case, these involve using projected thermal vorticity and suitably adjusting the spin relaxation time ( $\tau_s$ ). From our analysis, we determine that  $\tau_s \approx 5 \text{ fm}/c$ , which is comparable to other estimates. We also present our progress on numerical simulations.

**Authors:** Dr JAISWAL, Amaresh (National Institute of Science Education and Research); Dr RYBLEWSKI, Radoslaw (Institute of Nuclear Physics PAN); BANERJEE, Soham; FLORKOWSKI, Wojciech (Jagiellonian University); Mr BHADURY, Samapan (Jagiellonian University)

**Presenter:** BANERJEE, Soham

**Session Classification:** Parallel B

**Track Classification:** 4. Collective dynamics - conserved charges, spin, vorticity, freezeout, afterburner