



## Study of Lambda polarization at RHIC BES energies

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In hydrodynamic approach to heavy ion collisions, hadrons with nonzero spin produced out of the fluid can acquire polarization via spin-vorticity thermodynamic coupling mechanism [1]. The hydrodynamical quantity steering the polarization is the thermal vorticity, that is minus the antisymmetric part of the gradient of four-temperature field  $\beta^\mu = w^\mu/T$ .

Based on this idea, it has been shown in the framework of cascade+viscous hydro model, UrQMD+vHLLC [2] that in Au-Au collisions at RHIC Beam Energy Scan (BES) the mean polarization of Lambda hyperons grows with decreasing collision energy up to 1.5% at  $\sqrt{s_{NN}} = 7.7$  GeV RHIC Au-Au collisions. This goes in line with recent measurements of Lambda polarization by STAR experiment [3].

We complement the existing Lambda polarization studies at RHIC BES [2] by exploring:

- polarization splitting between Lambda and anti-Lambda, and related effect of magnetic field at hadronization
- centrality dependence and connection between angular momentum of the system and polarization of produced Lambda
- rapidity and transverse momentum dependence of the polarization

We also explore the longitudinal component of polarization, which is dominant for nonzero  $p_T$  at top RHIC and LHC energies.

[1] F. Becattini, V. Chandra, L. Del Zanna, E. Grossi, Ann. Phys. 338 (2013) 32.

[2] I. Karpenko, F. Becattini, arXiv:1610.04717, to be published in EPJC.

[3] STAR collaboration, arXiv:1701.06657

### List of tracks

Hydrodynamics

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