



Contribution ID: 89

Type: Talk

## Lambda polarization in heavy-ion collisions from hydrodynamic modelling (a review)

Thursday 8 September 2022 09:20 (20 minutes)

Polarization of Lambda hyperons, produced in relativistic heavy-ion collisions, has been discovered in 2017 by STAR experiment in the Beam-Energy Scan program at RHIC. The trends in the global Lambda polarization are in good agreement with hydrodynamic models. However, the transverse momentum dependence of polarization components in the out-of-plane direction and beam direction does not agree with the models, which still constitutes a puzzle.

In this talk we present practical calculations of lambda polarization components in the out-of-plane and beam directions, in heavy-ion collisions at  $\sqrt{s_{NN}}$  from a few GeV to 5.02 TeV, in a 3+1 dimensional viscous hydrodynamic model vHLE, and overview the results from hydrodynamic simulations by other groups. We show that the inclusion of a recently found additional term of the spin polarization vector at local equilibrium which is linear in the symmetrized gradients of the velocity field, and the assumption of hadron production at constant temperature and inclusion of bulk viscosity in fluid dynamical simulations, restore the quantitative agreement between hydrodynamic model predictions and local polarization measurements in relativistic heavy ion collisions at  $\sqrt{s_{NN}}=200$  GeV and 5.02 TeV.

### Is this abstract from experiment?

No

### Name of experiment and experimental site

NA

### Is the speaker for that presentation defined?

Yes

### Details

Iurii Karpenko, FNSPE CTU in Prague, Czech Republic

### Internet talk

No

**Author:** KARPENKO, Iurii (FNSPE CTU in Prague)

**Co-authors:** PALERMO, Andrea; BECATTINI, Francesco

**Presenter:** KARPENKO, Iurii (FNSPE CTU in Prague)

**Session Classification:** Heavy Ion Collisions and Critical Phenomena