**INTRODUCTION**

The experimental evidences for polarization of hyperons in heavy-ion collisions found by STAR collaboration attracted recently much attention. The studies of polarization are often performed in the framework of approach exploring local equilibrium thermodynamics and hydrodynamical calculations of vorticity. There is another approach to polarization. The so-called axial vortical effect being the macroscopic manifestation of axial anomaly leads to induced axial current of strange quarks which may be converted to polarization of Λ-hyperons. The effect is proportional to vorticity and helicity of the strong interacting medium, and, in particular, to helicity separation effect discovered in the kinetic Quark-Gluon-String Model (QGSM) and confirmed in PHSD model. This helicity separation effect receives the significant contribution ∼ $\mathcal{O}(2)$ from the transverse component of velocity and vorticity. It is easily explained by the same signs of transverse vorticities in the "upper" and "lower" (w.r.t. reaction plane) half-spaces, combined with the opposite signs of velocities. At the same time, even larger contribution of longitudinal components of velocity and vorticity ∼ $\mathcal{O}(2)$ implies the appearance of the "quadrupole" structure of longitudinal vorticity, recently found in the hydrodynamical approach.

**VORTICITY AND VORTEX SHEET**

There are several definitions of vorticity. We will use the relativistic kinetic vorticity:

$$\omega_{\mu} = \frac{1}{c} \mathcal{E}_{\nu} \partial_\nu \mathcal{E}_\mu - \partial_\nu \mathcal{E}_\mu,$$

where $u_\mu$ is a relativistic four-vector of the velocity field. If $t = 0$, means that the nuclei began to overlap and $t = t_0$ means that they completely passed each other ($\mathcal{E}(t=t_0) = 2R/\gamma_c$).

As can be seen, the quadrupole structure is observed inside the fireball and on the border with the spectators (XY and ZY planes). In sum, they give a mirror quadrupole structure.

**VORTICITY FORMATION**

The quadrupole structure of vorticity is clearly observed in the planes $xy$ and $yz$. In the $xz$ plane, it is visible only inside the fireball.

**HELICITY SEPARATION.**

We performed the numerical simulations in QGSM model (PHSD in progress). The A polarization is emerging due to the polarization of $\bar{s}$—quarks, which has the same sign, as the axial current and charge $C$-even operators. The magnitude of the A is larger as the same axial charge is distributed between the polarizations of the smaller number of particles.

**POLARIZATION.**

In the case of relativistic vorticity, γ-factor has a significant influence on the fireball boundaries, strengthening the vortex sheet.