

The Hyperon Production in Bi+Bi Collisions at NICA and the Angular Dependence of the Hyperon Spin Polarization

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The strange baryon production in Bi+Bi collisions at $\sqrt{s_{NN}} = 9.0$ GeV is studied applying the PHSD transport model. Hyperon and anti-hyperon yields, transverse momentum spectra, and rapidity spectra are calculated, their centrality dependence and an impact of the rapidity and transverse momentum cuts are investigated. Hydrodynamic velocity and vorticity fields are calculated and the formation of two oppositely-rotating vortex rings moving in opposite directions along the collision axis is found. Hyperon spin polarization induced by the medium vorticity within the thermodynamic approach is calculated and the dependence of the polarization on the transverse momentum and rapidity cuts and on the centrality selection is analyzed. It is shown that for the hyperon polarization mechanism, considered in the paper, the structure of the vorticity field makes an imprint on polarization signal as a function of the azimuthal angle in the transverse momentum plane, ϕ_H , $\tan \phi_H = p_y/p_x$.

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