

## Lambda polarization in peripheral heavy ion collisions

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Relativistic thermodynamics with spin provided the polarization to characterize the spin alignment in rotating systems. Based on a high-resolution, (3+1)D particle-in-cell relativistic (PICR) hydrodynamics simulation, we obtain the polarization vector for Lambda hyperons at NICA and FAIR energies, and find that the y- component of the polarization vector is dominant, while x- and z- components are anti-symmetric in the transverse momentum space. This implies a vanishing contribution to the global polarization in the E<sub>bE</sub> c.m. frame. The linear dependence of polarization on impact parameter reveals that the polarization stems from the initial orbital angular momentum; the polarization effect is found to decrease with increasing energy, which is in line with the recent results from RHIC BES program, and is attributed to the more intensive thermal motion of particles at higher energies. The time evolution of the polarization in our calculation agrees with the time evolution of vorticity predicted previously.

[1] Y.L. Xie, D.J. Wang, and L. P. Csernai, Phys. Rev. C 95, 031901(R) (2017).

[2] Y.L. Xie, M. Bleicher, H. Stöcker, D. J. Wang, and L. P. Csernai, Phys. Rev. C 94, 054907 (2016).

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