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Investigation of spectator-driven effects on anisotropic flow formation at the NICA energy range

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Anisotropic flow is a fundamental observable in relativistic heavy-ion collisions that describes the anisotropy in the azimuthal distribution of emitted particles. It develops mainly due to pressure gradients generated during the early stages of the collision, which transform the spatial anisotropy of the initial overlap region into momentum anisotropy of the final-state particles. In the energy range of NICA complex, due to longer passge time, spectators can strongly influence the observed flow through interactions with emitted particles. In this work, we study the influence of spectator matter on anisotropic flows in Ag+Ag, Au+Au, Xe+Xe, and U+U collisions at (\sqrt{s_{NN}}=2.4)–4.5 GeV using a modern transport model. Calculations with and without spectator propagation are compared for different particle species, collision energies, and centralities to estimate the spectator contribution to the directed (v1), elliptic (v2), triangular (v3), and quadrangular (v4) flow coefficients.

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