Tilted geometry in the heavy-ion collisions

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The focus of this work is the tilt of the pion emission source in Au+Au collisions at $\sqrt{s_{NN}} = 7.7$ to 27 GeV, based on data from the STAR experiment. The tilt is known to originate from the 3D structure of the initial collision geometry, such as the geometric overlap of two nuclei, and is important for understanding phenomena such as directed flow and polarization.

Using azimuthally-sensitive femtoscopy method of identical pion pairs we are going to show correspondence between the obtained tilt parameter and the actual tilt of the freeze-out coordinates predicted by the UrQMD model. Although one might expect the tilt to depend primarily on the collision centrality, we found that it actually depends much more strongly on the momentum of the particle pairs. We will discuss the reasons behind this result and compare the results obtained in the model with those from the experiment.