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# Assessing the centrality degree of relativistic nucleus-nucleus interactions

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Experiments on the study of colliding beams have great potential for studying the formation of secondary particles in relativistic nucleus-nucleus interactions. But, unfortunately, they do not have enough information about the initial stage of interaction. In this regard, it is difficult to separate dynamic fluctuations associated with the formation of quark-gluon plasma from fluctuations caused by the features of the initial stage of interaction. Experiments with a fixed target have a significant advantage in studying the initial state of the interaction, since they make it possible to register fragments of the projectile-nucleus and target-nucleus.
The present analysis has been carried out with the data obtained from nuclear emulsion track detector.
Stacks of NIKFI BR-2 emulsions (containing Ag, Br, C, N, O, and H nuclei) have been exposed to a 10.6 AGeV ^{197}Au beam at Brookhaven National Laboratory synchrotron.
Based on the analysis of fragments of interacting nuclei, criteria for assessing the degree of peripherality (centrality) of nucleus-nucleus interaction have been developed.
One of the most optimal parameters for assessing the degree of centrality of the interaction is the dependence of the number of fragments of the target-nucleus Nh on the multiplicity of particles ns.
For Au + AgBr interactions, the average Nh-ns distribution demonstrates a steady increase, and then reaches a plateau. The Au + CNO distribution shows similar behavior, but with a lower multiplicity. This behavior reflects the degree of peripherality of the interaction. On the growing branch of the middle Nh-ns curve, the lower the multiplicity, the higher the peripherality of the interaction. After reaching the maximum value of Nh, an increase in the multiplicity of events corresponds to an increase in the degree of centrality of the interaction.
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**Primary author:** Mrs IBRAIMOVA, Saera (Institute of Physics and Technology, Almaty, Kazakhstan)

**Co-authors:** FEDOSIMOVA, Anastasia; LEBEDEV, Igor (Institute of Physics and Technology, Almaty, Kazakhstan); Dr DMITRIYEVA, Elena (Institute of Physics and Technology, Almaty, Kazakhstan); Dr KRASSOVITSKIY, Pavel (Institute of Nuclear Physics, Almaty, Kazakhstan)

**Presenter:** Mrs IBRAIMOVA, Saera (Institute of Physics and Technology, Almaty, Kazakhstan)

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