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FLUCTUATIONS AND CORRELATIONS IN RELATIVISTIC NUCLEUS–NUCLEUS COLLISIONS

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A joint study of multi-particle pseudo-rapidity correlations and event-by-event fluctuations in the distributions of secondary particles and fragments of the target nucleus and the projectile nucleus was carried out in order to search for correlated clusters of secondary particles. An analysis of the collisions of the sulfur nucleus with photoemulsion nuclei at an energy of 200 AGeV is presented based on experimental data obtained at the SPS at CERN. The analysis of multi-particle correlations was performed using the Hurst method. A detailed analysis of each individual event showed that in events of complete destruction of a projectile nucleus with a high multiplicity of secondary particles, long-distance multi-particle pseudo-rapidity correlations are observed. The distribution of average pseudo-rapidity in such events differs significantly from others, as it is much narrower, and its average value is noticeably shifted towards lower values average pseudo-rapidity. This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. AP23487706).

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