Critical behaviour of the characteristics of hadron-nucleus and nucleus-nucleus interactions depending on the centrality degree of collisions.

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Abstract

The experimental results on the correlation between the behaviour of the characteristics of secondary particles and the centrality degree of collisions (Q, or the disintegration degree of nuclei) are presented. The results demonstrate that there is a boundary value of $Q = Q^*$ which fixes the region of central collisions (and the region of processes with total disintegration of nuclei).

The percolation cluster existence was discussed as one of the reasons of the critical behaviour of the events characteristics near the boundaries of the central collision region.

The obtained results show that the influence of nuclear fragmentation processes on the behaviuor of the event distributions is also of a critical character.

An anomalous peak in the angular distributions of slow protons in π^--meson$+C$-interactions with total disintegration of the carbon nucleus at a momentum of 40 GeV/c is considered as an additional confirmation of the existence of percolation clusters.