

XXV International Baldin Seminar on High Energy Physics Problems
"Relativistic Nuclear Physics and Quantum Chromodynamics"



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Investigation of Relativistic Nuclear Collisions in the Four-velocity Space

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The report presents the results of the development of the approach to the study of relativistic nuclear interactions in the four-velocity space using the similarity principle.

The essence of the modification of the self-similar approach consists in the inclusion of quark-gluon dynamics in the generation of hadrons in the nuclear-nuclear interactions in the central rapidity region. Inclusive spectra of pions and kaons produced in p+p and nuclear-nuclear collisions were studied as functions of their transverse momentum p_T in the central rapidity region, calculated within the framework of a modified approach based on the assumption of similarity of inclusive hadron spectra. A satisfactory description of the NA61/SHINE data for the ratios of the K^+/π^+ and K^-/π^- yields as functions of \sqrt{s} in p+p and Be+Be collisions is also presented. The results of calculations of the yield ratios of antiparticles to the yields of particles (anti-p/p, anti-d/d, anti- $^3\text{He}/^3\text{He}$) in proton-proton and nuclear-nuclear interactions using the similarity parameter in the central rapidity region are presented and compared with world experimental data.

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