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Research program for rare processes with large transverse momenta at the Nuclotron

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The program is aimed at the experimental search for and study of new phenomena and the development of new approaches to solving pressing problems of relativistic nuclear physics, such as the issues of deconfinement and phase transition at low temperatures and high densities, the properties of diquarks, light exotic states, and polarization anomalies at large transverse momenta. To address these problems, it is planned to create a multi-purpose facility at the extracted beams of the Nuclotron, capable of operating at the maximum achievable intensities of extracted proton and light-nucleus beams. An intense proton or light-nucleus beam and a large acceptance will make it possible to study rare processes in which at least one of the secondary particles has the maximum transverse momentum achievable at Nuclotron energies. In such interactions, it is intended to perform, alongside with inclusive measurements, correlation (including femtoscopy) and exclusive measurements. The organization of a staged development of the program is considered, from preliminary experiments and techniques development to a full-scale facility with a large acceptance.

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