

Cold Superdense Baryonic Component of Nuclear Matter

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Started in the late 1950s at DLNP JINR pioneering experimental studies of proton scattering on nuclei allowed D.I. Blokhintsev assumed the presence in nuclei a lower mass nucleus in a compressed state, i.e. the presence of a cold strongly compressed component in ordinary nuclear matter. The search and study of two- and three-nucleon systems in nuclei continued at DLNP JINR and ITEP (Moscow) and beyond. The investigations were carried out in the kinematic region, outside the kinematic of the nucleon-nucleon interaction. In the future, the processes in this kinematic region were called cumulative processes.

In this report the results of the cumulative processes study outside of the nuclear fragmentation region and with production of particles with the transverse momentum greater than 1 GeV/c is presented. These experiments were carried out with proton and carbon nuclei beams by the IHEP(Protvino) accelerator complex. The data were takeout using the SPIN set up –single-arm magnetic spectrometer. The obtained data showed that the processes of direct knock-out of deuteron and tritium nuclei with momentum up to 6.5 GeV/c are observed. This confirms the presence of deuterons and tritium in the nuclear matter in a highly compressed state, in other words, existing of the cold superdense baryonic component.

Section

Nuclear structure: theory and experiment

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