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COMPARISON OF SOME KINEMATICAL CHARACTERISTICS OF PROTONS IN COLLISIONS n12C AND p12C AT 4.2 GeV/s

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It is known, the interaction of high-energy protons with nucleons and nuclei has been well studied experimentally in a wide range of primary energies, and due to the difficulties in obtaining monochromatic beams of neutral particles, experimental information on collisions of neutrons with nuclei (nA) obtained under the conditions of 4π-geometry very rare [1-3] and based on few statistics. Therefore, obtaining experimental data on nA collisions and comparing them with data on pA interactions at the same energy and for the same target nucleus is of considerable interest. The work is devoted to a comparative analysis of various kinematic characteristics of protons in n12C and p12C collisions at a momentum of 4.2 GeV/s.

Experimental material was obtained using a two-meter propane bubble chamber of the High Energy Laboratory of the Joint Institute for Nuclear Research (Dubna, Russia), irradiated with beams of protons, deuteron nuclei (d = 2H) and helium-4 at a momentum of 4.2 GeV/s per nucleon at the synchrophasotron in Dubna [2]. The average values of the total and transverse momenta of protons with their average escape angles and speed in n12C and p12C collisions are obtained separately for events with and without negative pions in the final state of the reaction. The average value of the total momentum of protons produced in n12C collisions with n ($\pi-$) = 0 is much smaller than in p12C collisions , since most of the protons in this case come from the target. In the case when one or several negative pions are formed in an event, the average value of the total momentum of protons in n12C collisions is greater than in p12C interactions .

A comparative analysis of the mean values of various kinematic characteristics of protons produced in n12C and p12C collisions at 4.2 GeV/s has been carried out. The difference in the average momenta of protons in n12C and p1 C is related to the difference in the probabilities of proton conservation in the first case and recharging of the primary neutron by a proton in the second.

REFERENCES

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No

Section

1. Intermediate and high energies, heavy ion collisions

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