absorption of produced slow pions or resonances by few-nucleon systems can be one of the possible mechanisms causing the formation of the relatively energetic nucleon-fragments. As a result of these reactions, the "cumulative" protons can be produced provided that the energy of the absorbed pion or resonance is high enough.

The study of production of proton-fragments was carried out in $\pi^{-}{}^{12}C$ interactions at 4.5 and 40 GeV/c, $n^{12}C$ interactions at 7 GeV/c, $\pi^{-}Ne$ interactions at 25 and 50 GeV/c, $p^{20}Ne$ interactions at 300 GeV/c, ^{16}Op interactions at 3.25 A GeV/c. The limiting behavior of some characteristics of proton-fragments was found out in these classes of interactions for the first time. The independence of the mean multiplicity of protons with momenta 0.2 – 1.2 GeV/c and of the distributions on multiplicity from the energy of an impinging particle was established pointing out the dominating role of the processes of high energy cascade of the initial and secondary particles. The weak (or may be none) dependence of characteristics of proton-fragments from the type of the impinging particle was found out. The dependence of the mean multiplicity from the mass number has the power-like form A^n with n close to 2/3, which is characteristic for the geometrical approach.

In pNe interactions at 300 GeV/c and $\pi^{-}{}^{12}C$ interactions at 4.5 and 40 GeV/c, the presence of the structure – the deviation of the differential cross section of protons flying back in laboratory frame from the monotonous dependence in region $P_p \approx 0.3\text{-}0.5$ GeV/c in the momentum spectrum – was found out. It was shown that the observed singularity is due to the reactions of absorption of pions or meson resonances by the highly bound few nucleon systems. This phenomenon, showing up stronger at relatively small nuclei, is interpreted by the presence of the short time correlations of intranuclear nucleons. The more detailed analysis of ^{16}Op interactions at 3.25 A GeV/c showed that the structure observed at energy spectrum of protons in the range $T \approx 70\text{-}90$ MeV in the oxygen rest frame is due to the decay of two-nucleon (deuteron-like) system as a result of its absorption of the slow pion. The universal singularity was found out in the momentum spectrum of protons flying forward in the rest frame of fragmenting nucleus, expressed by an independence of mechanism of formation of these protons (excluding the "evaporated" protons) from the initial energy and the type of target-nucleus. The shape of the momentum spectrum of protons flying to the forward hemi-sphere in the rest frame of fragmenting nucleus does not depend on degree of nucleus excitation, which characterizes the extent of the intranuclear cascade. The existence of strong correlation between the shape of the momentum spectrum of proton-fragments, especially the slow ones, and the degree of excitation of the fragmenting nucleus was shown.

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PRODUCTION AND RECOMBINATION OF GLUONS

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Nonlinear Markov process of parton production has been considered. The Kolmogorov equation is applied for the evolution equation based on the approximation of independent gluons production in every decay act. We introduced a "crossing" parameter and used the combination relations to obtain nonlinear recombination equation for the evolution of gluon structure function.