

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



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on High Energy Physics Problems
Relativistic Nuclear Physics & Quantum Chromodynamics

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Fragmentation features of Be, B nuclei in nuclear track emulsions

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Nucleon associations (clusters) are one of the basic phenomena in atomic nuclei structure. Their simplest observable manifestations are the lightest He and H nuclei. Superpositions of the lightest clusters and nucleons form subsequent nuclei (including unstable ^8Be and B), which act as constituent clusters themselves for more complicated nuclear systems. The phenomena of cluster dissociations of light Be and B isotopes are discussed. Charge topology and angular spectra of fragmentation of 1.2 A GeV ^7Be nuclei in nuclear track emulsion are presented. The dissociation channels $^4\text{He} + ^3\text{He}$, $2^3\text{He} + n$, $^4\text{He} + 2^1\text{H}$ are considered in detail. It is established that the events $^6\text{Be} + n$ amount about to 27% in the channel $^4\text{He} + 2^1\text{H}$. The experimental results are compared with model data of fragmentation of such nuclei in nuclear track emulsions.

The next topic consisted in the study of unstable states of ^9Be and ^9B . The experimental data for this nuclei obtained in relativistic fragmentation of carbon (^{10}C) and berillium (from 10B) fragmentation in nuclear track emulsions. The opportunity of searching with nuclear track emulsions for more complex excitations in light nuclei - isobar-analogue states for ^9Be and ^9B isotopes are discussed [1-3].

References

- [1] P. I. Zarubin Lecture Notes in Physics, Vol. 875, Clusters in Nuclei, Volume 3. Springer Int. Publ., 51 (2013) [arXiv:1309.4881].
- [2] D. A. Artemenkov et al., ^8Be and ^9B nuclei in dissociation of relativistic ^{10}C and ^{11}C nuclei, EPJ Web of Conferences DOI: 10.1051/ conf/201611 0602.
- [3] P. I. Zarubin et. al., Prospects of Searches for Unstable States in Relativistic Fragmentation of Nuclei, Physics of Atomic Nuclei, 2022, Vol. 85, No. 6, pp. 528–539.

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