

The first results of analysis of nuclear track emulsion exposed to relativistic nucleus ^{11}C and ^{10}B

Tuesday, 6 October 2015 14:30 (30)

Featuring an excellent sensitivity and spatial resolution nuclear track emulsion (NTE) maintains the position of a universal and inexpensive detector for survey and exploratory research in microcosm physics. Use of this classical technique on beams of modern accelerators and reactors turns out highly productive. In a number of important tasks the completeness of observations provided in NTE cannot be achieved for electronic detection methods. In particular, in the last decade clustering work of a whole family of light nuclei including radioactive ones was investigated in the processes of dissociation of relativistic nuclei in NTE [1, 2].

Recent data on pattern of diffractive dissociation of the ^{11}C and ^{10}B will be discussed in this context. It is already established that 144 “white” stars produced by the ^{11}C in NTE are distributed over the charge channels in the following way: $2\text{He} + 2\text{H}$ (50%), 3He (17%), $^7\text{Be} + \text{He}$ (13%), $\text{He} + 4\text{H}$ (11%), $\text{B} + \text{H}$ (5%), $\text{Li} + \text{He} + \text{H}$ (3%), 6H (2%). The distributions of He fragments over the opening angle $\theta_{2\text{He}}$ show that $^8\text{Be}_{g.s.}$ decays are presented in 21% $2\text{He} + 2\text{H}$ and 19% in the 3He events. These distributions allow one to assume a strong contribution of $^8\text{Be}_{2+}$ decays but it is a subject of future consideration. The ^9B nucleus can exist in ^{11}C as an independent virtual component or as a component of a virtual basis ^{10}B .

Measurements of the first 21 stars pointed to four decays $^8\text{Be}_{g.s.}$, two of which originated from $^9\text{B}_{g.s.}$ decays. Measurements of “white” stars ^{10}B , including identification of He and H isotopes by a multiple scattering method, are in progress now.

1. P.I. Zarubin // Lect. Notes in Phys. 2013 V.875. P.51.
2. K.Z. Mamatkulov et al. // Phys. At. Nucl. 2013 V.76. P.1224.

Presentation type

Poster

Primary author(s) : Mr. ZAITSEV, Andrey (JINR)

Co-author(s) : ARTEMENKOV, Denis (JINR); Dr. ZARUBIN, Pavel (Joint Institute for Nuclear Research)

Presenter(s) : Mr. ZAITSEV, Andrey (JINR); Dr. ZARUBIN, Pavel (Joint Institute for Nuclear Research)

Session Classification : Poster Session I

Track Classification : Nuclear physics and particle physics