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Dissociation of Relativistic ^{10}B Nuclei

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Abstract. 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.

The preliminary analysis of the NTE has pointed out that triples 2He + H constitute about 63% among 158 "white" stars found to that time. However, origins of this effect have not been studied being in a "shadow" of emerging studies with radioactive nuclei. To date, measurements of emission angles of relativistic fragments are performed in 276 events ^{10}B $\rightarrow$ 2He + H including 151 "white" stars. The distribution of 2He pairs over the opening angle Θ_{2He} in an interval $0 < \Theta_{\text{narrow}} < 10.5$ mrad allows one to count 54 decays 8B$_{\text{g.s.}}$ in all found events ^{10}B $\rightarrow$ 2He $+$ H including 39 in the "white" stars. Then, the condition on the opening angle $\Theta(^{8}\text{Be}_{\text{g.s.}} + \text{H}) < 25$ mrad allows one to identify 27 decays ^{9}B in all found events and 21 in the "white" stars. Identification of He and H isotopes by a multiple scattering method progressing now will promote the analysis.