

# STUDY OF HIGHLY EXCITED STATES OF ${}^9\text{Li}$ ISOTOPE IN PION ABSORPTION REACTION

Chernyshev B.A., Gurov Yu.B., Korotkova L.Yu., Lapushkin S.V., Pritula R.V.,  
Sandukovskiy V.G.

*National Research Nuclear University "MEPhI", Moscow, Russia*

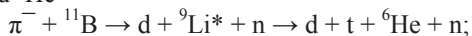
E-mail: korotkovalara@gmail.com

Search for the highly excited states of  ${}^9\text{Li}$  was provided in  ${}^{11}\text{B}(\pi^-, \text{dt})X$  reaction. The measurements were carried out at low energy pion channel of LANL with two-arm multilayer semiconductor spectrometer [1].

The analysis of two-dimensional distributions (Dalitz' diagram) allowed to identify following reaction channels:

Quasi-particle pion absorption on the intra-nuclear cluster of  ${}^5\text{Li} \pi^- + {}^5\text{Li} \rightarrow \text{d} + \text{t}$ , where the residual  ${}^6\text{He}$  system is a "spectator"; thus, indications of the existence of the rare cluster structure in  ${}^{11}\text{B}$  nuclei were found: ( ${}^6\text{He} + {}^5\text{Li}$ ).

The cascade process with the formation of  ${}^9\text{Li}$  excited states, which break up with respect to t and  ${}^6\text{He}$



two-particle channels  $\pi^- + {}^{11}\text{B} \rightarrow \text{d} + {}^9\text{Li}^*$  and the following  ${}^9\text{Li}^*$  decay.

In the Missing Mass spectrum of  $\pi^- + {}^{11}\text{B} \rightarrow \text{d} + {}^9\text{Li}^*$  two-particle channel reaction the highly excited  ${}^9\text{Li}$  level was found for the first time. It was shown that this state breaks up with the triton emission, his resonance parameters are  $E_x \approx 11 \text{ MeV}$ ,  $\Gamma \approx 1 \text{ MeV}$ .

1. M.G.Gornov *et al.* // Nucl. Inst. and Meth. in Phys.Res. A. 2000. V.446. P.461.