

## Experimental studies of differential cross sections of ${}^7\text{Li}+{}^{10}\text{B}$ reaction products

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At cyclotron U-400 of the Flerov Laboratory of Nuclear Reactions of Joint Institute for Nuclear Research (Dubna, Russia), the differential cross sections for the elastic and inelastic scattering of  ${}^7\text{Li}+{}^{10}\text{B}$  reaction products (see Fig.1) have been measured at  $E_{\text{LAB}} = 58$  MeV of  ${}^7\text{Li}$  beam. One of the aim of the experiment was to measure the experimental angular distributions of the differential cross sections for  ${}^7\text{Li}_{g.s.}$ ,  ${}^6\text{Li}_{g.s.}$ ,  ${}^6\text{Li}^*(J^\pi=0^+; E=3,56 \text{ MeV}; T=1)$  states to investigate and compare their spatial properties at the same experimental condition.

The excited state of  ${}^6\text{Li}^*(J^\pi=0^+; E=3,56 \text{ MeV}; T=1)$  is the isobaric analogue state of the  ${}^6\text{He}_{g.s.}$ . Due to isospin symmetry of strong interaction, this isobaric analog state  ${}^6\text{Li}^*(J^\pi=0^+; E=3,56 \text{ MeV}; T=1)$  has the same spatial and spin features as  ${}^6\text{He}_{g.s}$  halo nucleus [1, 2].

In Ref. [3] a hypothesis was put forward about n-p halo structure of  ${}^6\text{Li}$  ground state, which was indirectly confirmed by comparison of  $\sigma_R$  values of  ${}^6\text{He}, {}^6,7\text{Li}+{}^{28}\text{Si}$  reactions [4,5] and intermediate width of  ${}^4\text{He}$  momentum distribution in  ${}^6\text{Li}$  breakup reactions [6].

The experimental angular distributions of  ${}^7\text{Li}_{g.s.}$ ,  ${}^6\text{Li}_{g.s.}$ ,  ${}^6\text{Li}^*(3.56 \text{ MeV})$  are shown in Fig. 2.

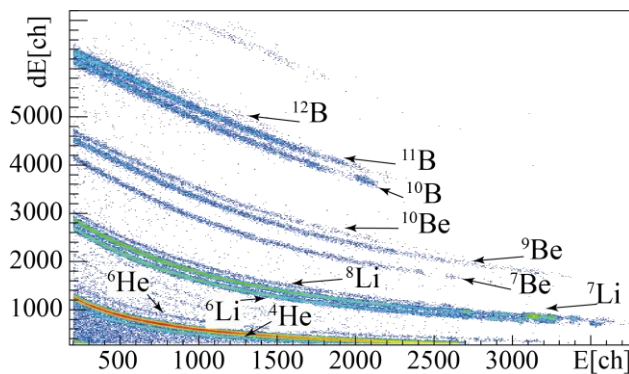


Fig.1.  $dE \times E$  matrix of  ${}^7\text{Li} + {}^{10}\text{B}$  reaction products, measured at  $\Theta_{\text{LAB}}=28^\circ$ .

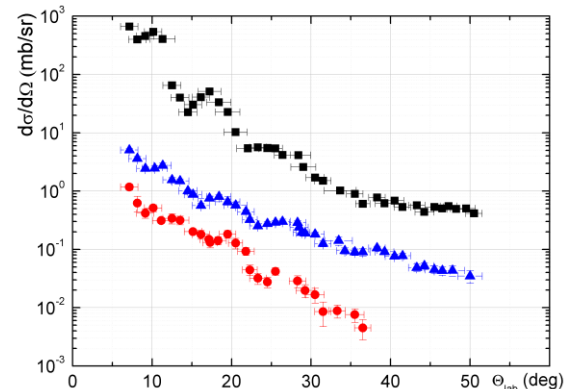


Fig.2.  ${}^7\text{Li}_{g.s.}$ ,  ${}^6\text{Li}_{g.s.}$  and  ${}^6\text{Li}^*(3.56 \text{ MeV})$  angular distributions:  
 Black square -  ${}^7\text{Li}_{g.s.}$ ; Blue triangle -  ${}^6\text{Li}_{g.s.}$ ;  
 Red circle -  ${}^6\text{Li} (J^\pi=0^+; E=3.56 \text{ MeV}; T=1)$

The work has been funded by the Russian Science Foundation, project No. 24-22-00117.

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