

MEASUREMENT OF ANGULAR DISTRIBUTIONS OF DIFFERENTIAL CROSS SECTIONS OF PRODUCTS OF THE ${}^7\text{Li}+{}^{10}\text{B}$ REACTION

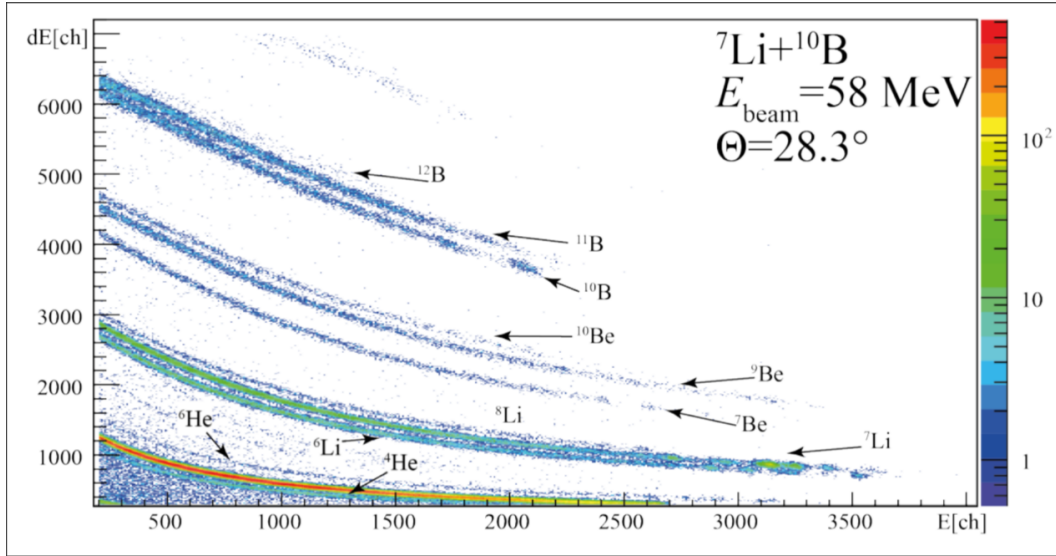
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Measurements were carried out of the angular distributions of the differential cross sections of the reaction products ${}^7\text{Li}+{}^{10}\text{B}$ $E_{\text{LAB}} = 58$ MeV. One of the objectives of the measurements was to compare the root-mean-square radii of the ground and excited states of nuclei obtained in the reaction. In the experiment, the angular distributions of ${}^7\text{Li}_{\text{g.s.}}$, ${}^6\text{Li}_{\text{g.s.}}$, ${}^6\text{Li}^*(3.56 \text{ MeV})$, as well as ${}^{11}\text{B}^*(8.56 \text{ MeV})$ were of interest. The ${}^6\text{Li}^*$ nucleus is in the $J^\pi = 0^+$; $T = 1$; $E = 3.56 \text{ MeV}$ is the isobaric analogue state of ${}^6\text{He}_{\text{g.s.}}$. The ${}^{11}\text{B}^*$ nucleus is in the $J^\pi = 3/2^-$ state; $E = 8.56 \text{ MeV}$, according to [1], is a cluster state, similar to the previously discovered Hoyle state ${}^{12}\text{C}^*$, $J^\pi = 0^+$; $T = 0$; $E = 7.65 \text{ MeV}$, predicted in [2] and first discovered in [3] by measuring the angular distributions of differential cross sections. The measurements were carried out on the ${}^7\text{Li}$ beam ($E_{\text{LAB}} = 58 \text{ MeV}$) of the U-400 accelerator of the FLNR JINR using 8 $dE - E$ semiconductor telescopes. A typical two-dimensional $dE - E$ spectrum is shown in Fig. 1.



Experimental matrix $dE \times E$ of reaction products ${}^7\text{Li} + {}^{10}\text{B}$, at an angle $\Theta_{\text{LAB}} = 28^\circ$ at energy $E_{\text{LAB}} = 58 \text{ MeV}$.

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