

EXPERIMENTAL INVESTIGATIONS OF ATOMIC NUCLEUS PROPERTIES

HIGH EXCITED STATES OF ${}^6\text{He}$

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High excited states of heavy helium isotope ${}^6\text{He}$ were studied in stopped pion absorption on ${}^9\text{Be}$ and ${}^{10,11}\text{B}$ nuclei. The measurements were carried out at low energy pion channel of LANL with two-arm multilayer semiconductor spectrometer [1].

Several levels of ${}^6\text{He}$ were originally observed. In two reaction channels ${}^{10}\text{B}(\pi^-, \text{pt})X$ and ${}^{11}\text{B}(\pi^-, \text{dt})X$ state with $E_x \approx 9.3(2)$ MeV and $\Gamma \approx 1.0(4)$ MeV was produced. Beyond the threshold of ${}^6\text{He}$ decay on two tritons ($E_x \geq 12.3$ MeV) two states of ${}^6\text{He}$ with $E_x = 22(1)$ MeV, $\Gamma = 2.7(1.4)$ MeV and $E_x = 27.0(8)$ MeV, $\Gamma = 2.5(1.1)$ MeV were observed in the ${}^{10}\text{B}(\pi^-, \text{pt})X$ channel.

In measurements of ${}^9\text{Be}(\pi^-, \text{t})\text{t}$ reaction we separated ${}^6\text{He}$ excited states decaying on $\text{t} + \text{t}$. For the first time three levels with $E_x = 15.8(6)$ MeV, $\Gamma = 1.1(6)$ MeV, $E_x = 20.9(3)$ MeV, $\Gamma = 3.2(1.5)$ MeV and $E_x = 31.1(1)$ MeV, $\Gamma = 6.9(2.3)$ MeV were observed.

Our results were compared with theoretical and experimental results obtained up to now.

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