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# Specific features of light halo nuclei in interaction with α-particles

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In recent years, the study of light weakly bound nuclei has not become less interesting due to the development of both experimental facilities and theoretical approaches. The nucleus 9Be having Borromean structure was the subject of study on its manifestation of cluster in direct nuclear reactions [1]. In particular, it was found that in the 9Be(d,α)7Li nuclear reaction the 5He heavy cluster is transferred mainly simultaneously, and the contribution of its sequential transfer is an order of magnitude lower. The importance of taking into account the mechanism of sequential transfer of the n–p system was revealed. Based on these observations, it was concluded that the 9Be nucleus may have cluster structure.

There is a need further broaden the theoretical research method, supposed in Ref. [1], with the nuclei 6He and 6Li. The experimental data on elastic scattering of α-particles by 6He and 6Li demonstrate significant growth of cross section at backward angles. Such kind of behaviour is characterized by contribution of the elastic transfer channel [2, 3].

The study of this work is based on the three body wave function using the Gaussian basis [4]. It worth to note that the three body model excludes the Pauli forbidden states by means of the method of orthogonalizing pseudo-potentials [5]. The analysis based on the CRC calculations shows that the major contribution to the elastic transfer cross section is resulted from the di-nucleon transfer channel, whereas the sequential transfer is one order of magnitude lower.

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