

## THEORETICAL ANALYSIS OF NEUTRON TRANSFER AND BREAKUP IN ( $^{11}\text{Li} + ^9\text{Be}$ ) AND ( $^{11}\text{Li} + ^{12}\text{C}$ ) REACTIONS AT LOW ENERGIES

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We calculated neutron transfer and nucleus breakup cross sections in reactions of  $^{11}\text{Li}$ -nucleus with  $^9\text{Be}$  and  $^{12}\text{C}$  at  $E_{c.m.} = 3\text{--}50$  MeV. The evolution of probability density of external weakly bound neutrons of  $^{11}\text{Li}$  and the probabilities of neutron transfer and nucleus breakup are determined based on numerical solution of the time-dependent Schrödinger equation. We carried out theoretical analysis of neutron rearrangement in fusion and transfer reactions by approach proposed in [1, 2]. Such approach makes it possible to obtain a microscopic description of dynamics of nuclear fusion [1, 2], neutrons stripping and pick-up [3], and breakup of nuclei [4]. Figure 1 present the example of the evolution of probability densities of external neutron of  $^{11}\text{Li}$  in the collision with  $^{12}\text{C}$ . The time-dependent Schrödinger equation allowed us to access visually the dynamics of taking place processes. The external neutrons of  $^{11}\text{Li}$  nucleus may be removal during two processes: transfer to target nucleus and break up to unbound states of continues energy spectrum.

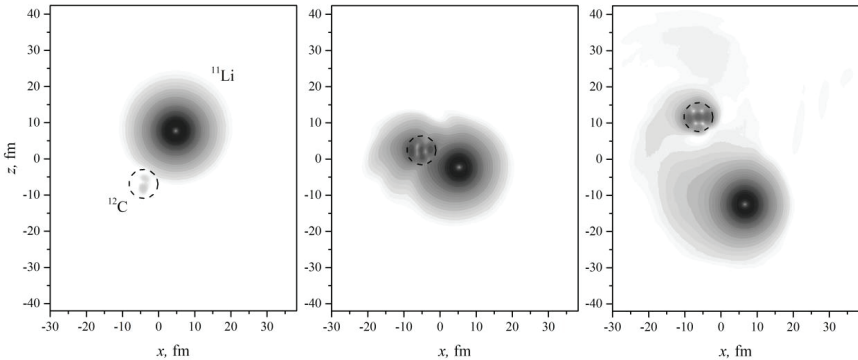


Fig. 1. Evolution of probability densities of external neutron of  $^{11}\text{Li}$  in the collision with  $^{12}\text{C}$  at  $E_{c.m.} = 18$  MeV. Impact parameter  $b = 9$  fm. Time scale from left to right. Dash circle is  $^{12}\text{C}$  nucleus.

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