

# TIME-DEPENDENT MICROSCOPIC DESCRIPTION OF FAST ALPHA PARTICLES EMITTED IN NUCLEUS-NUCLEUS COLLISIONS

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Appearance of new experimental data on the energy spectra of fast alpha particles emitted in heavy-ion reactions [1,2] requires development of microscopic models of such processes. The mechanism of nonequilibrium emission of alpha particles after capture of the projectile nucleus by the target nucleus is studied within the microscopic approach based on the time-dependent Schrödinger equation for the wave function of an alpha particle [1,3] (Fig. 1). Transfer of energy from the colliding nuclei to the alpha particle is studied in the quantum three-body one-dimensional time-dependent model [4]. The possibility of cooling of superheavy compound nuclei via emission of fast alpha particles (e.g., in the reaction ) is discussed.

Fig. 1. Evolution of the wave function of emitted alpha particle in the collision of  $^{48}\text{Ca} + ^{197}\text{Au}$  at beam energy 280 MeV.

1. Yu. E. Penionzhkevich, V. V. Samarin, V. A. Maslov *et al.*, Phys. At. Nucl. 84, 115 (2021).
2. Yu. E. Penionzhkevich, S. M. Lukyanov, V. A. Maslov *et al.*, Phys. At. Nucl. 85, 145 (2022).
3. V. V. Samarin, Phys. At. Nucl. 81, 486 (2018).
4. V. I. Zagrebaev and V. V. Samarin, Phys. At. Nucl. 70, 1003 (2007).

## The speaker is a student or young scientist

No

## Section

1. Experimental and theoretical studies of nuclear reactions

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