

SCATTERING OF  ${}^6\text{He}$   
ON  $\alpha$ -PARTICLE: MICROSCOPIC GUIDANCE  
FOR ORTHOGONALIZING PSEUDOPOTENTIALS

*Yu.A. Lashko*<sup>1</sup>, *G.F. Filippov*<sup>1</sup>, *L. Canton*<sup>2</sup>

<sup>1</sup>Bogolyubov Institute for Theoretical Physics,  
Nat. Acad. of Sci. of Ukraine  
(14b, Metrolohichna Str., Kyiv 03680, Ukraine;  
e-mail: *ylashko@gmail.com*),

<sup>2</sup>Istituto Nazionale di Fisica Nucleare, Sezione di Padova  
(Via Marzolo 8, 35131 Padova, Italy)

S u m m a r y

Within a microscopic two-cluster model, we discuss the influence of the Pauli exclusion principle on the scattering of  ${}^6\text{He}$  on  $\alpha$ -particle. The structure of the Pauli-forbidden and the Pauli-allowed states is analyzed in detail. The influence of the Pauli-allowed states with eigenvalues other than unity on the kinetic energy of the relative motion of  ${}^6\text{He}$  and  $\alpha$ -particle results in the effective interaction between these nuclei. This effect can be simulated to some extent with finite values of orthogonalizing pseudopotential strength. We estimate the strength and the range of such interaction within a microscopic model and provide a guidance for choosing the parameters of the orthogonalizing pseudopotential.