SPECTRUM OF RESONANCE STATES IN ^{6}He. EXPERIMENTAL AND THEORETICAL ANALYSES

O.M. Povoroznyk[1], *V.S. Vasilevsky*[2]

[1]Institute for Nuclear Research,
Nat. Acad. of Sci. of Ukraine
(*47, Prosp. Nauky, Kyiv 03680, Ukraine;*
e-mail: orestpov@kinr.kiev.ua),
[2]Bogolyubov Institute for Theoretical Physics,
Nat. Acad. of Sci. of Ukraine
(*14b, Metrolohichna Str., Kyiv 03143, Ukraine;*
e-mail: VSVasilevsky@gmail.com)

S u m m a r y

We explore the structure of resonance states in ^{6}He by experimental and theoretical methods. We present the results of experimental investigations of the three-body continuous spectrum of ^{6}He. For this aim, we use the reaction $^3\mathrm{H}(\alpha, p\alpha)\,nn$, which is induced by the interaction of alpha-particles with a triton at the beam energy $E_\alpha = 67.2$ MeV. The theoretical analysis of the resonance structure in ^{6}He is carried out within the framework of a three-cluster microscopic model. The model exploits the hyperspherical harmonics to describe the intercluster dynamics. The set of new resonance states is discovered by the experimental and theoretical methods. The energy, width, and dominant decay channels of resonances are determined. The obtained results are compared in detail with the results of different theoretical models and experiments as well.