

## The modern concept of the cluster spectroscopic characteristics

The subject of the talk is the theory of the cluster and nucleon spectroscopic factors. A mathematical proof of the necessity for taking into account the channel wave-function renormalization generated by the exchange terms of the antisymmetrization operator is given. This property was ignored in earlier approaches. Unfortunately, the 'old' version is in use up to now through habit. The correct procedure was first time recommended in [1].

In the present study it is reliably demonstrated that the use of the "new" spectroscopic characteristics, which are defined, following by the prescriptions of Ref. [1], with allowance for renormalization makes it possible to meet the unitarity conditions for the set of amplitudes for the formation of various states of a compound nucleus. Owing to this, the cross sections of compound nuclear reactions becomes consistent with regularities inherent in the statistical theory. The averaged values of alpha-particle spectroscopic characteristics obtained in the framework of the discussed approach turn out to be in a good agreement with the alpha-particle strengths deduced from the analysis of wide-range measurements of the cross-sections of  $(n,\alpha)$  reactions.

The technique of calculations of the discussed characteristics in advanced shell-model approaches including ab initio ones is also presented. The types of nuclear decays and reactions which could be described more or less adequately in the framework of traditional "non-renormalized" approaches are considered.

1. Fliessbach T., and Mang H. J. // Nucl. Phys. A. 1976. V. 263, P. 75.
2. Kadmsky S. G., and Furman V. I. //Alpha Decay and Related Nuclear Reactions (Energoatomizdat, Moscow, 1985) .

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