Contribution ID : **212** Type : **Poster**

Combinatorial method of nuclear level density calculation within Folded Yukawa Potential with metastable states and its effect on reaction cross sections

Tuesday, 27 October 2026 19:25 (5)

Nuclear self-consistent mean field result in appearance of series of single-particle states [1, 2], which can be obtained within Folded Yukawa Potential [3, 4]. Combinatorial method is developed to calculate level density ρ. In this approach, its possible to also get metastable states, leading to altering level density and effecting nuclear cross sections of, in particular, astrophysical purpose [6], which were calculated in TALYS software package [5] with the implementation of obtained level density.

1. Bohr A., Mottelson B. Nuclear Structure. Single-particle motion. — W. A. Benjamin,1969. — 1219 p.
2. Ring P., Shuck P. The Nuclear Many-Body Problem. — Springer-Varlag. 1980.
3. Uhrenholt H., Aberg S., Moller P. et. al. Combinatorial nuclear level-density model // Nuclear Physics A. 2013. V. 913. P. 127.
4. Nix J. R. Calculation of fission barriers for heavy and superheavy nuclei // Annual Review of Nuclear Science. 1972. V. 22(1). P. 65-120.
5. Koning A., Hilaire S., Goriely S. TALYS-1.9. A nuclear reaction program. User Manual. — 2017.
6. Murphy R. J., Kozlovsky B., Kiener J., Share G. H. Nuclear gamma-ray de-excitation lines and continuum from accelerated-particle interactions in solar flares // The American Astronomical Society. 2009. V. 183(1). P. 142.

Primary author(s) : TROFIMOV, Leonid; SITKOV, Dmitrij

Presenter(s) : TROFIMOV, Leonid

Session Classification : Poster session

Track Classification : Nuclear physics