



Contribution ID: 44

Type: Poster

## Evaluation of Transmission Coefficients in Nuclear Processes

*Tuesday 9 July 2024 17:50 (1 minute)*

Transmission coefficients describe the probability that a micro-particle will pass through a potential barrier. Using a quantum mechanical approach, the reflection factor is used to calculate the transmission coefficients for charged and neutral particles. Logarithmic derivative is calculated using a rectangular potential in the internal region. With a computer code developed by the authors, and based on Hauser-Feshbach formalism, cross-sections of fast neutron-induced reactions followed by the emission of charged particles are evaluated. When discrete states of residual nuclei are considered, the realized codes agree with experimental data. The present quantum approach can be extended to continuum states of residual nuclei using the integral form of penetrability coefficients, including nuclear density states described by nuclear Fermi-gas model.

### References

1. A. Foderaro, The Neutron Interaction Theory, The MIT Press, Cambridge, Massachusetts and London, England (1971)
2. David. J. Griffiths, Introduction in Quantum Mechanics (Second Edition), Cambridge University Press, New York (2016)
3. G.A. Gamow, Z. Phys. 51, 204 (1928)
4. E.U. Condon, R.W. Guernsey, Nature, 122, 439 (1928)
5. [5] V. Hauser, W. Feshbach, Phys. Rev., 87, 2, 366 (1952)
6. P. A. Moldauer, Rev. Mod. Phys., 36, 1079 (1964)
7. C. Oprea, A. Mihul, A.I. Oprea, CERN-Proceedings-2019-001, 125 (2019)

**Primary authors:** OPREA, Cristiana (ANCS Romania, National Department of Education Bihor); Dr OPREA, Ioan (ANCS Romania, National Department of Education Bihor)

**Presenter:** OPREA, Cristiana (ANCS Romania, National Department of Education Bihor)

**Session Classification:** Poster Session

**Track Classification:** Optical model