

Excitation and decay of the Gamow-Teller resonance and its satellites in compound nuclei

I. N. Izosimov

Joint Institute for Nuclear Research, Dubna, Russia

e-mail: izosimov@jinr.ru

The Isobar-Analog Resonance (IAR) can be successfully excited in direct charge-exchange nuclear reactions, in compound nucleus reactions, and in β -decay. The Gamow-Teller Resonance (GTR) and its satellites can manifest themselves both in the β -decay of atomic nuclei and in direct charge-exchange nuclear reactions [1]. The excitation and decay of the IAR, GTR, and their satellites cannot be described by statistical theory [1], [2], [3]. The so-called intermediate structure is clearly manifested in the envelope of the fine structure of these resonances [2], [3]. Deviations from the statistical theory have been observed in (p,γ) reactions. For (p,γ) reactions, the observed non-statistical effects can be connected with the neutron excess in $N>Z$ nuclei and the excitation of GTR satellites in compound nuclei [3].

This report analyzes non-statistical effects manifested in nuclear reactions involving heavy ions and low-energy protons beams are analyzed. The association of non-statistical effects in nuclear reactions with the excitation of GTR, its satellites and spin–isospin $SU(4)$ symmetry is discussed.

References

1. Yu. V. Naumov, A. A. Bykov, I. N. Izosimov, Sov. J. Part. Nucl., **14**(2), 175 (1983).
2. I. N. Izosimov, EPJ Web of Conferences, **239**, 02003 (2020).
3. I. N. Izosimov, JINR Preprint E6-2024-14. Dubna, 2024.