

# Decay of the spontaneous fission isomers in the Coulomb field of third nucleus

**Author:** Farrukh Otakhonov<sup>1</sup>

**Co-authors:** Shuhrat Kalandarov<sup>1</sup>; Yury Pyatkov<sup>2</sup>

<sup>1</sup> *BLTP, JINR*

<sup>2</sup> *FLNR, JINR*

**Corresponding Author:** farrux\_otaxonov99@mail.ru

Spontaneous ternary decay of the  $^{252}\text{Cf}$  was observed in series of experiments carried out in Flerov Lab. of Nuclear Reactions, JINR [1-3]. In those experiments, the existence of a new type of ternary decay in the reaction  $^{235}\text{U}(nth, f)$  and  $^{252}\text{Cf}(sf)$ , namely collinear cluster tri-partition (CCT), was reported. It is also observed that spontaneous fission products with the mass number around 120-130 goes into secondary fission channel when they interact with the foil (Al, Cu, Pt).

In this work, we develop a model for calculation of decay half-lives of spontaneous fission isomers, formed in spontaneous ternary fission of  $^{252}\text{Cf}$ , in the Coulomb field of foil nucleus. Our model is based on the TNS model, developed for description of ternary decay process of heavy nuclei [4]. The spontaneous fission isomers are treated as a dinuclear system, formed during the ternary decay of  $^{252}\text{Cf}$ . The results of calculations show us that the decay half-life of dinuclear system strongly effected by collective excitations caused by Coulomb field of foil nucleus.

#### Literature

1. Y.V. Pyatkov, et. al, Phys. At. Nucl. 66 (2003) 1631.
2. Y.V. Pyatkov et. al, Eur. Phys. J. A 45 (2010) 29.
3. Y.V. Pyatkov, et. al, Phys. Rev. C 96 (2017) 064606.
4. Sh. Kalandarov et al., Phys. Lett. B 850 (2024) 138522.