

BREMSSTRAHLUNG ACCOMPANYING TERNARY FISSION OF NUCLEI

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Nuclear fission accompanied by light charged particle emission is a hot topic of modern nuclear physics. One of the intriguing questions here is ternary fission. To date, some experimental data has already been accumulated and different model approaches has been developed (see [1–4] and references cited therein). A major interest to this process is related to the possibility of obtaining additional data about the dynamics of the fission process. In the proposed paper we consider never analyzed before possibility of emission of bremsstrahlung photons which should accompany such considered type of fission. For study we choose the ²⁵²Cf nucleus (as for it there is some experimental information, see [3]). As a new theoretical development of our model [5–10], in calculation of the bremsstrahlung spectra we take possibility of simultaneous emission of α -particle and other fragments during fission. We analyze and estimate contribution of photons which α -particle gives into the total bremsstrahlung spectrum. We clarify how the bremsstrahlung spectrum depends on the spatial geometry of processing ternary fission. Such result could be new promising tools for obtaining new information about dynamics of ternary fission process from analysis of the spectra of the emitted photons.

1. I. Halpern, *Ann. Rev. Nucl. Sci.* **21**, 245 (1971).
2. M. Mütterer, J. P. Theoband, *Nuclear Decay Modes*, edited by D. Poenary, (IOP, Bristol, 1996), Chap. 12.
3. A. V. Daniel et al., *Phys. Rev.* **C69**, 041305 (2004).
4. V. I. Zagrebaev, A. V. Karpov, W. Greiner, *Phys. Rev.* **C81**, 044608 (2010).
5. S. P. Maydanyuk, V. S. Olkhovsky, G. Mandaglio, M. Manganaro ety al., *Phys. Rev.* **C82**, 014602 (2010).
6. S. P. Maydanyuk, V. S. Olkhovsky et al., *Nucl. Phys.* **A823**, 38 (2009).
7. S. P. Maydanyuk, V. S. Olkhovsky, *Eur. Phys. Journ. A* **28**, 283 (2006), [nucl-th/0408022](#).
8. G. Giardina, G. Fazio et al., *Mod. Phys. Lett.* **A23**, 2651–2663 (2008), [arXiv: 0804.2640](#).
9. G. Giardina, G. Fazio, et al., *Europ. Phys. Journ.* **A36**, 31–36 (2008).
10. S. P. Maydanyuk, *The Open Nucl. Part. Phys. Journ.* **2**, 17–33 (2009) [open access].