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Measurements of γ-ray multiplicity correlated with fission fragments mass and kinetic energy

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The nuclei generated at scission are left in highly excited states, and will dissipate their excitation energy and angular momentum through the emission of neutrons, photons and conversion electrons. In this context, the study of prompt γ-ray emission is an interesting tool to assess the angular momenta of the fragments after neutron emission. In particular, measurements of the mass-dependent prompt γ-rays multiplicity $M_{\gamma}(A)$ (i.e. the average number of photons emitted by the highly excited fission fragments) are of primary interest.
However, such measurements are challenging, as both fragments are simultaneously emitting γ-rays, shortly after scission. Two methods were developed decades ago to tackle this issue: the collimator method [1,2] and the "weighting method"[3,4], also referred as Doppler-shift method. This second method was recently applied to the VESPA setup (VErsatile γ SPectrometer Array) to extract the prompt γ multiplicities for the spontaneous fission of 252Cf, as a function of fission fragments mass and total kinetic energy [5]. In this talk, the experimental procedure used in this recent experiment will be presented. The results obtained will be discussed, and will be compared to other multiplicity measurements performed in the past for various fissionning systems, and results from recent calculations with the FIFRELIN [6] code.

References :
1. S.A.E Johansson, Nucl. Phys. 60, 378 (1964)
2. P. Armbruster, H. Labus and K. Reichelt, Z. Naturforsch. A 26, 512 (1971)
3. H. Maier-Leibnitz, H.W. Schmitt and P. Armbruster, in Proceedings of the Symposium on the Physics and Chemistry of Fission, Salzburg, IAEA, Vol. II, p. 143 (1965)
4. F. Pleasonton, R.L. Ferguson and H.W. Schmitt, Phys. Rev. C 6, 1023 (1972)
5. M. Travar, V. Piau, A. Göök et al., Phys. Lett. B 817, 136293 (2021)
6. O. Litaize, O. Serot and L. Berge, Eur. Phys. J. A 51, 177 (2015)

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