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Double-hit experimental approach in studies of the multibody decays of heavy nuclei

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In our previous publications [1–3], a very specific effect, unknown in the past, was discussed, namely a break-up of the fission fragment while it passes through a solid-state foil. The fraction of the fragments which undergo the break-up is supposed to be born in the shape isomer states. The bulk of the results were obtained in the frame of the so-called missing mass experimental method when only one of two partners of the break-up is detected by the spectrometer. The difference between the total mass of the detected fragments and the mass of the mother system serves a sign of at least ternary decay. Alternative, so called"double-hit"approach lets obtain more direct information about the process. By definition, the double-hit registration approach means that two fragments were detected in the same PIN diode during one registration gate of 200 ns length. If a minimum time interval between their time stamps is less than 30 ns a pile-up of the signals take place. Restoring original signals from pile-up is discussed.

References

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2. D. V. Kamanin, Yu. V. Pyatkov, A. N. Solodov et al., Proc. of the 28th Inter. Nuclear Physics Conference (INPC 2022), Cape Town, South Africa, 11–16 September 2022. Journal of Phys: Conf. Series 2586, 2023, art. 012043.

3. A. O. Strekalovsky, D. V. Kamanin, Yu. V. Pyatkov et al., Bull. of the Russian Academy of Scien.: Phys. 84 (4), 469 (2020)

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