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Determination of sample thicknesses used in measurements of heavy nuclei fission cross sections on the neutron time-of-flight spectrometer GNEIS

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Recently, studies of the nuclear fission process [1] induced by neutrons with energy up to 500 MeV have been carried out at the neutron time-of-flight spectrometer GNEIS in the NRC "Kurchatov Institute"-PNPI (Gatchina, Russia) [2]. Determination of the number of nuclei (sample thickness) in the studied samples is one of the main issues in the processing of the obtained data. Therefore, we developed a set-up to determine the number of nuclei in the samples used. The method of alpha counting at a defined solid angle was applied as most optimal for our case [3]. A description of the setup, data acquisition and processing system is presented in this paper. For example, the result of measuring the thickness of the 243Am sample is presented with an analysis of uncertainties. References:

- A. S. Vorobyev, A. M. Gagarski, O. A. Shcherbakov, L.A. Vaishnene, A. L. Barabanov, T. E. Kuz'mina, Measurement of the 236U fission cross section and angular distributions of fragments from fission of 235U and 236U in the neutron-energy range of 0.3-500 MeV, Phys. Rev. C 108, 014621 (2023).
- 2. O.A. Shcherbakov, A.S. Vorobyev, E.M. Ivanov, Spallation neutron source GNEIS, Physics of Particles and Nuclei, v.49, No 1, pp. 81-83, (2018).
- 3. S. Pomme, Methods for primary standardization of activity, Metrologia 44, S17 (2007).

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