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Investigation of the neutron beam parameters of the time-of-flight spectrometer GNEIS

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The paper presents the digital parameter measurement results processing of the neutron time-of-flight spectrometer GNEIS at the NRC «Kurchatov Institute» –PNPI in the neutron energy range from 0.3 to 500 MeV. The energy spectrum of the neutrons was measured using an ionization fission chamber with a 235U target. An assembly of two position-sensitive multiwire proportional low-pressure counters was used to determine the beam profile. The data accumulation and processing system was organized on the basis of 8-bit signal digitizers with a sampling rate of 500 MHz. Python language with NumPy and pandas data processing libraries, matplotlib library for graphical display of processing results was chosen as the machine processing tool. To speed up the processing of the raw data and display of the obtained results, the interactive IPython interpreter in the Jupyter-notebook variant was used.

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