SPECTROMETRY OF ALPHA PARTICLES AND FISSION FRAGMENTS USING TIMEPIX3 DETECTORS AND CAEN ELECTRONICS

The project is dedicated to learning the standard approaches of alpha- and as fission fragments spectrometry using TIMEPIX3 detectors and CAEN experimental electronics. Special attention is paid to exploring fission isomers of the fragments from binary fission of low exited heavy nuclei that were observed for the first time at FLNR some years ago.

During the project students learn how use various CAEN hard- and software to simulate as well as register real experimental data, process and analyse experimental alpha- and fission fragments spectra.

Students become acquainted with TIMEPIX3 pixel detectors, the latest generation of Medipix family of readout chips and detector assemblies for particle detection and imaging. The tasks during the practice include time and energy calibration of the TIMEPIX3 detector; using TIMEPIX3 to measure fission fragments angular distribution; using TIMEPIX3 to experimentally demonstrate the break-up of the shape-isomers in the solid-state foils.