

# Evaluation of data acquisition system based on FPGA and continuous readout of the J-PET detector

## Summary

It was possible to design, construct, test and bring to full operation a new data acquisition system for the J-PET detector, based on FPGA and with continuous readout. The system works in a trigger-less mode and allows to collect tomographic data for Positron Emission Tomography as well as experimental data from particle decays, such as e.g. positronium, used both for research on fundamental studies and for the development of a new type of imaging - positronium imaging. The obtained time resolution (30 ps TDC resolution and 250 ps signal reconstruction) allows for the reconstruction of the annihilation position with a precision of a few cm. The system data flow rate was tested for various activities of the  $^{18}\text{F}$  source and reached rates up to 1 GBp/s

