

THE DIGITAL TDPAC SPECTROMETER FOR CONDENSED MATTER RESEARCH AT LOW TEMPERATURE AND HIGH PRESSURE

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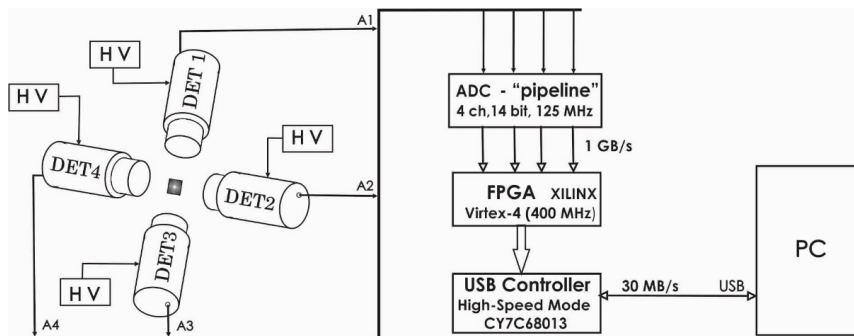
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The digital time-differential perturbed angular gamma-gamma correlation (TDPAC) spectrometer was created in LNP JINR. This spectrometer is based on the four LaBr₃ detectors and digital signal processor. The setup is also equipped with helium cryostat JANIS SHI-950 and three high pressure cells: “toroid”-type for pressure up to 10 GPa, piston-cylinder type for pressure up to 2 GPa and diamond anvil cell (DAC) for pressure up to 60 GPa. This equipment allows us to conduct the TDPAC measurements at liquid helium temperature and at high pressure.

The new scintillation detectors and modern digital electronics and algorithms provide:

- Good energy (better than 3% at 662 keV) and time (about 400 ps for ⁶⁰Co cascade) resolution;
- High intensity and efficiency of recording the information (about five thousand coincidences per second);
- The compactness of the spectrometer provides mobility for conducting the measurements at different locations (on accelerators and reactors).



Block diagram of the digital TDPAC.