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A DAQ System for Pixel Array Detectors for Synchrotron Radiation Facilities

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Pixel array detectors (PAD) are widely used in the synchrotron radiation facilities (SRF). This work aims to develop a common data acquisition (DAQ) system for PAD users. It provides the most essential functionalities such as data readout and real-time image display, and offers the customized functionalities including run control, data processing & transmission, event building, lossless compression, data storage, etc. The DAQ software consists of a dataflow layer and an interactive layer. The user interface is developed with the open source QT framework. In order to verify the DAQ design and performances, a prototype system has been built and tested with the HEPS-BPIX 1M detector, which is a high-frame-rate pixel detector working in the single-photon-counting mode. During the tests, all functionalities have been demonstrated, and the system can run stably with ˜2GB/s readout bandwidth. The detailed design, implementation and performance tests will be presented.

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