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Multi Module >50 kfps Detector System for Time Resolved Experiments

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We have successfully developed multi module version of the XSPA detector series. XSPA detector is one of the fastest solution for time resolved X-ray and electron experiments. It has maximum of 56 kfps sustainable framerate and 970 kfps burst mode framerate. XSPA module is designed based on UFXC readout chip designed at AGH University [1].

Conventional multi module detectors have lower framerate due to the limitation of the band width. We also have the same option to reduce the cables and controlling PC for the ease of use. But we know there are some experiments which requires large area and speed at the same time. So we have decided to design the multi module version to maintain the framerate and proved it works with 56 kfps without any drawback. Some test results of the prototype multi module detectors will be presented.

[1] P. Grybos et al., "32k Channel Readout IC for Single Photon Counting Pixel Detectors with 75 μm Pitch, Dead Time of 85 ns, 9 e-rms Offset Spread and 2% rms Gain Spread," IEEE Trans. Nucl. Sci., vol. 63, no. 2, pp. 1155-1161, Apr. 2016. DOI: 10.1109/TNS.2016.2523260. [Online].

Available: <https://ieeexplore.ieee.org/document/7454876>.

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