Preliminary results of pixel detector development for X-ray, and low energy gamma-ray all-sky monitor (AXGAM)

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New, high spatial resolution CdZnTe (CZT) and Silicon (Si) pixel detectors are strongly suitable for X-ray astronomy. These detectors are planned for use in wide field of view, imaging, X-ray and low energy gamma-ray, all-sky monitor (AXGAM) in a future space mission. The high stopping power of CZT detectors combined with low-noise front-end readout makes possible an order of magnitude improvement in spatial (angular) and energy resolution in X-ray detection. AXGAM will be built in the form of a fine coded aperture placed over a two-dimensional, high spatial resolution and low energy threshold CZT pixel detector array. Progress in pixel detector development for AXGAM will be presented. First the structure of the pixel detector signal processor will be discussed in detail. The characteristics of the Application Specific Integrated Circuit (ASIC) for AXGAM front-end will be presented and the developed test system for pixel detector will be outlined. Electronic aspects limiting pixel detector resolution will be discussed using an example of AXGAM pixel detector. Preliminary results of pixel detector readout tests will be presented, and the design of a CZT detector prototype for AXGAM will be sketched. The recent results obtained with CZT and Si pixel detector prototypes with the developed readout system will also be presented.