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The design of an active pixel sensor test structure optimised for the readout of scintillator screens

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The design of pixel test structures for CMOS active pixel sensors (APS) being developed by Brunel University and e2v technologies ltd are described in this paper. The APS pixel is a development of a standard readout and sensing arrangement employing three transistors per pixel but has been optimised for indirect x-ray detection applications. The pixel is tuned to have a narrow band response to visible light generated by a scintillator screen and also has a high well capacity. This application demonstrates some of the challenges that need to be overcome when using the standard CMOS foundry processes to develop APS for scientific imaging applications and we present the possibility of using a custom CMOS process to create a low noise high fill factor/QE pinned photodiode pixel

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