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Characterisation of Vanilla - a Novel Active Pixel Sensor for Radiation Detection

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A monolithic active pixel sensor, Vanilla, with 512x512 pixels (25 μ m square) has been fully characterised for the first time. Using PTC (Photon Transfer Curve) measurements allowed for the calculation of the read noise, shot noise, full well capacity and camera gain constant. Spectral response measurements detailed the QE of the detector through the UV and visible region. Optimisation of the sensor was made through variation between readout modes (analogue and digital), frame rates, integration times and on-chip biases and voltages. Further comparisons were made with a Vanilla sensor with a thicker epi-layer (20 μ m, instead of the standard 14 μ m), to help determine whether or not such sensors are - along with bio-medical and space applications - suitable for use in particle physics experiments.

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