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High-rate, high-resolution single photon X-ray imaging: Medipix4, a large 4-side buttable pixel readout chip with high granularity and spectroscopic capabilities

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Medipix4 is a hybrid pixel detector readout chip for single photon X-ray imaging, with 320 x 320 pixel array, each pixel being 75 μm x 75 μm in size. The chip operates in two modes: Fine Pitch Mode with a 75 μm sensor pixel pitch and two threshold bins per pixel, and Spectroscopic Mode with a 150 μm sensor pitch and up to eight energy threshold bins. The chip can be fully tiled in both x and y directions, allowing for seamless large area coverage. The chip has a size of 24.075 mm x 25.570 mm and covers 99.37 % active area when using TSV connections only. The readout architecture features energy analysis of the single photons, which includes charge sharing correction to bin the energy spread over adjacent incoming hits. This presentation will describe the chip architecture and show the first measurements.

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