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MICROELECTRONICS TECHNOLOGIES FOR NEW DETECTORS IN MEDICAL IMAGING

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Abstract

Invited Tutorial

Microelectronics technologies play an ever more important role in medical imaging, both in the imaging devices themselves and in the digital capabilities to enhance and analyze the image. This trend will continue in the future, and instrumentation developments in elementary particle physics can serve as a proving ground for new directions in digital imaging detectors. Specific aspects are the use of direct conversion in a semiconductor matrix, innovative 3-dimensional detector construction, very fast signal processing, on-line data pre-processing and massive parallelism at the system level. Besides the general roadmap in CMOS the presentation will discuss recent directions in technology that aim at system integration at the hardware level such as multilayer devices and high density interconnects. With the Medipix development as an example, the ultimate aim of single photon imaging will be discussed. The cost aspects of the semiconductor imager options have to be taken into account in the R&D phase.

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