



ČESKÉ VYSOKÉ UČENÍ TECHNICKÉ V PRAZE
ÚSTAV TECHNICKÉ A EXPERIMENTÁLNÍ FYZIKY

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POZVÁNKA

na 268. seminář ÚTEF ČVUT v Praze
pod záštitou Československé sekce NPSS IEEE

X-ray Phase Contrast Imaging with Hybrid Semiconductor Pixel Detectors

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Abstract: Phase contrast imaging, a technique utilizing the wave nature of ionizing radiation for image formation, is currently considered as a most promising way leading to soft tissue contrast improvement and dose reduction in X-ray radiography. Present approaches however put very stringent requirements on experimental instrumentation (the need of highly-brilliant X-ray sources provided namely by large synchrotron facilities, dedicated X-ray optics and elaborated image acquisition procedures such as multiple object exposure) which are usually not suitable for practical imaging applications. In frame of this work, a novel technique based on the combination of a laboratory compact X-ray tube and the hybrid pixel detector of the Medipix type in a table-top setup was developed. The technique provides the possibility to perform simultaneous single-exposure acquisition of the phase-gradient, of the conventional absorption image and alternatively also of the image based on the local scattering power of the sample. The experimental results on a simple testing object as well as on complex biological samples will be presented. The performance of the newly developed method in relation to various setup parameters such as used X-ray spectrum and detector settings will be discussed.

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