

Advanced solid-state X-ray detector for the analysis of thin layered structures

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The structural analysis of thin layered structures involves different X-ray scattering methods like rocking curve and reciprocal space mapping or reflectivity measurements. The instrumental configuration needed for these applications has to cover a high angular resolution and a high dynamical intensity range as compared to standard measurements on polycrystalline materials. This paper is about the application of a recently introduced solid-state detector based on the very latest pixel detection technology for the thin film analysis. This detector can be used as 0- as well as 1-D detector. In the 1-D mode it is capable to scan the diffracted angle or operate statically over a certain range. It can be combined with all diffracted beam optics. Due to its superior resolution and unmatched dynamic range it allows performing all types of X-ray scattering techniques. Intensities as high as 100 million cps are measured without the need of a beam attenuator. The performance of this detector will be discussed on several application examples including fast reciprocal space mapping on epitaxial structures.