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# Spatially resolved XRD using polychromatic fan beam and a hybrid pixel detectors Timepix3

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The utilization of hybrid pixelated detectors such as Timepix3 for imaging has already been proven to have many benefits compared to conventional detectors, e.g. CCDs. The proposed work exploits these benefits for material structure analysis using x-ray diffraction (XRD) with a polychromatic fan beam. This allows simultaneous analysis of material properties along the line of interest and thus provide spatially resolved information about differences in the sample structure, e.g. material impurities or uneven sample treatment.
The proposed measurement setup utilizes two Timepix3 detectors, off-the-shelf x-ray tube and a simple geometry, enabling in situ measurement.
The data provided by the Timepix3 detector contain both spatial and energy information for each detected photon and therefore advantages of a polychromatic beam can be fully exploited.
The complete data processing chain is described and the benefits of the presented approach are shown on a several measurements, performed on materials with different crystalline structures.

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