

### 1.9.7. TARGETED PLANAR CT WITH ROI ON THE SIDE SURFACE OF A RECTANGULAR-SHAPED SUBSTRATE

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**Abstract.** In computed tomography, targeted (or zoomed) reconstruction is usually used to achieve high-resolution reconstruction to a small region-of-interest (ROI). This paper reports a novel method which is able to only reconstruct the ROI of an object. The ROI is located at the corner of the object and does not pass through the central beam of the scan. The challenge work is to properly define the reconstruction matrix which just covers the targeted area. To achieve this purpose, we convert the fan-beam sinogram of the central-slice (defined as perpendicular to the detector plane) to a parallel-beam arrangement, from which we determine the actual scan start angle and the tilting angle of the object with respect to the rotation axis. Then, by estimating the ROI dimensions and virtually extending its length to the central-slice position following its original orientation, we can determine approximately from the central-slice sinogram its offset to the centre-of-rotation (COR). All the parameters determined above are then used to define the appropriate reconstruction matrix which corresponds to the ROI area only. By scanning and reconstructing the corner part of a printer ink-cartridge (fig.1), we demonstrate the advantages of the proposed method over traditional CT, including the smaller reconstruction size and less computation time, high-resolution reconstruction and good-orientated CT image for subsequent de-layering and visualization.

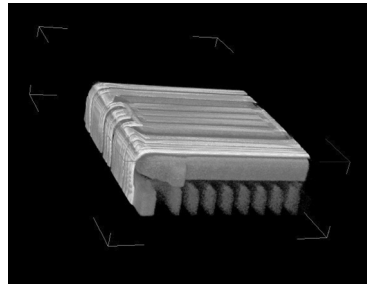
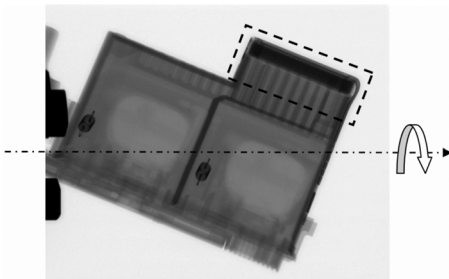


Fig. 1. A 2D image of the printer ink cartridge      Fig. 2. CT image of the ROI in fig. 1