Minimizing the inference of strong-absorption part to the weak-absorption ROI in CT inspection by obliquely mounting the object

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Abstract

In daily CT inspection practices, naturally we always prefer to scan an object by mounting it either with less mounting effort, or simply following its natural shape. This is reasonable due to the fact that we generally don't know if any specific mounting orientation would give us better reconstruction result than others, and the fact that a shape-based mounting usually leads to a simpler visualization process. However, we do have certain applications that involves both strong-absorption parts and weak-absorption parts in the object; and it happens to be some weak-absorption parts that are interesting to us. In this cases, an carefully defined mounting orientation is required to minimize the impact of the strong-absorption part to the weak-absorption part so that the later can be reconstructed with good quality.

This study demonstrates the use of the oblique-mounting strategy to inspect a planar weak-absorption region in a printer ink-cartridge. For illustration purpose, a CT scan with a general mounting practice is also conducted and presented. Both sets of data are reconstructed with SIMTech’s unique CT reconstruction software which is able to reconstruct an planar object always with the preferred orientation regardless of its actual orientation in the scan. It is conspicuous that with the oblique-mounting, the whole planar features in the region-of-interest can be reconstructed properly. On the contrary, with the normal mounting, the region of the ROI above the metal screws are seriously blurred due to the dominated contributions of the metal screws and become hard to interpret of its true picture.

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