Correction of ring artifacts in X-ray tomographic images

Ring artifacts are systematic intensity distortions located on concentric circles in reconstructed tomographic X-ray images. When using X-ray tomography to study for instance low-contrast grain boundaries in metals it is crucial to correct for the ring artifacts in the images as they may have the same intensity level as the grain boundaries and thus make it impossible to perform grain segmentation. This paper describes an implementation of a method for correcting the ring artifacts in tomographic X-ray images of simple objects such as metal samples where the object and the background are separable. The method is implemented in Matlab, it works with very little user interaction and may run in parallel on a cluster if applied to a whole stack of images. The strength and robustness of the method implemented will be demonstrated on three tomographic X-ray data sets: a mono-phase β-titanium alloy, a fossil plant and a dual-phased AlCu alloy. © 2011 by IJTS.