Optimization of Carbon Nanotube based CBCT for Improved Imaging of Soft Tissue and Metal Artefacts

Dental imaging techniques have significantly evolved over the last four decades. Although traditional computed tomography generates improved contrast compared to standard bitewing radiography, the rise of cone-beam computed tomography (CBCT) allows for a compact medical imaging device, widely used in clinics due to its isotropic images and diagnostic accuracy. Carbon nanotubes (CNT) are an evolving technology which allow for compact x-ray source arrays. This research aims to analyze and optimize the collimation, reconstruction software, and geometry of a prototype bench-top CBCT device using a carbon nanotube based x-ray source.