

# Anode effect of carbon nanotube cold cathode electron beam (C-beam) for high resolution x-ray tube

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We fabricated glass sealed x-ray tubes with carbon nanotube (CNT) cold cathode electron beam (C-beam). We used high performance CNT cold cathode as electron sources, and fabricated electron beam with triode configuration. The performance of x-ray images depend on the electron beam characteristics. We evaluated x-ray resolution with various I-V characteristics of CNT cold cathode. The x-ray image resolution is strongly related on the I-V characteristics of CNT emitters. With the optimized C-beam, we fabricated glass sealed x-ray tubes and analyzed x-ray images. The x-ray tube could operate up-to 80kV anode voltage and 3 mA anode current at DC mode. With pulse driving, anode current could reach on 30 mA. Also, x-ray image shows hundreds micrometer line resolved.

In this presentation, we will report on the fabrication process for the glass sealed x-ray tubes with high performance CNT cold cathode. X-ray images with the x-ray tube analyzed with various exposure conditions, such as mAs and anode bias. The relationship between electron emission characteristics of CNT emitters and x-ray image would be presented.