

## **The development of high efficiency X-ray tube with carbon nanotube yarn based-cold cathode**

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It is development high-efficiency X-ray tube using carbon nanotube yarn as an electronic source of field emission. It is inevitable to secure durability for uniform electronic emission characteristics of materials and to improve the stable structure of the emitter due to the miniaturization of the X-ray tube. Aimed at a high-efficiency X-ray generator with a new concept of cold-polar emission e-meter structure that can control the gap of uneven field discharge by a Chaos of uncontrolled faults in the process. The effects of various structures on the beam focusing performances and emission currents were simulated and fabricated. In the design of the X-ray sources, it is important to ensure that the fine beam focus and efficient electron emission can be simultaneously obtained. Therefore, the geometrical parameters, such as electrode shape and the gaps between parts should optimized. Owing to the unique design of the cathode, the electron beam emitted from the cathode was focused onto the anode without using electric lenses or extra biased electrodes. It was indicated that the beam spot sizes on the anode plate different with the changing electrode shape design. It will be studied that the optimum x-ray yield condition and focusing electrical shape effect in the CNT micro-focus CNT x-ray tube.

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