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Electrons Loss Characteristics Study on Bremsstrahlung Reflex Triode

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Experimental study of system-generated electromagnetic pulse effect requires large area hard x-ray source with the average energy of photons less than 100 keV and few electrons. Compared with the single diode, the bremsstrahlung reflex triode can generate hard x-ray more efficiently to meet the demand of experiment. Reflex triode applies two face-to-face cathodes to reflex the electrons. The electron makes multiple passes through the foil, so the generate efficiency of hard x-ray is improved.But some electrons lose energy in the foil holder without producing useful x-ray. So the study of the electrons loss characteristics is very important for the bremsstrahlung efficiency. In the paper, the electrons loss characteristics of the reflex triode were discussed by using PIC code and theory analysis. The influences of the foil size, cathode size and foil thickness on the electrons loss characteristics were considered, which provided references to reduce the loss of electrons.

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