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Experimental Investigation of a Pseudospark-Produced High-Brightness Electron Beam for X-ray Applications JING HU, JOSHUA ROVEY, APLab, Missouri University of Science and Technology, AEROSPACE PLASMA LABORATORY, MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY TEAM — This paper presents the progress in the experimental investigation of pseudospark-produced electron beams to drive x-ray emission for medical devices. Experiments are performed to determine the discharge behaviors (breakdown characteristics, electron beam generation efficiency) and the qualities of electron beams (peak current, energy spread, and transverse emittance) produced by a thirty-gap pseudospark device. The system is operated at 70kV. The breakdown voltage and discharge current are measured by a high voltage probe and Rogowski coil. A movable multi-probe array consists of 4 electrostatic probes to measure the beam currents profile at different radial and axial locations. Thus the energy spread and rms emittance of electron beams can be determined radially and axially. A discussion of the measured discharge characteristics and beam parameters to drive x-ray emission are also presented.

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