

Public Abstract

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Graduation Term:SS 2012

Department:Electrical Engineering

Degree:MS

Title:Investigation and Optimization of a High Voltage Piezoelectric Particle Accelerator

This research investigates the nature of compact high voltage sources known as piezoelectric transformers (PTs). The goal of this research is to determine if PTs can be used to drive compact x-ray sources. Commercial x-ray sources such as those used in medical applications typically require an operating voltage of at least 40-60 kilovolts (kV). The advantage of a PT-driven x-ray source is that it is more efficient, compact, and lightweight than traditional x-ray sources. A variety of experiments were developed to test the PT and multiple measurements confirmed that the PT met and exceeded the 60 kV requirement. Through this investigation, the PT has been shown to be a viable method for driving a compact x-ray source.