

MASTER OF SCIENCE IN PHYSICS

PARAMETRIC X-RADIATION FROM A BERYLLIUM CRYSTAL

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A source of monochromatic x-rays in the 16 keV to 24 keV range will provide improved contrast and overall image quality in mammography while also reducing overall patient dose [Ref. 6,7]. Based on theoretical work by Freudenberg [Ref. 6,9], beryllium (Be) was identified as a candidate to be a more efficient source of PXR based x-radiation in this energy range. This thesis describes the use of the NPS 100 MeV linear accelerator (LINAC) to conduct the first parametric x-radiation (PXR) experiments using a beryllium (Be) crystal. Energy spectra were collected from the beryllium crystal that differed from theoretical prediction. This thesis explores explanations of the spectra and provides a foundation of understanding of beryllium crystals for future experiments.

DoD KEY TECHNOLOGY AREA: Biomedical

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