Abstract Submitted
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Development of the GEM Detector for Medical Imaging MONICA AVILA, JAEHOON YU, JIN MINGWU, THOMAS BATES, University of Texas, Arlington, UTA ADVANCED DETECTOR DEVELOPMENT AND INTENSITY FRONTIER PHYSICS GROUP COLLABORATION — High energy physics explores the fundamental constituents of matter and the interactions that occur between them. To achieve this goal, HEP utilizes particle accelerators and advance detectors. The Gas Electron Multiplier (GEM) technology is an advanced technique in particle detection. The GEM applies a high electric field in a noble gas mixture for the purpose of ionization detection. The detection of beta particles using GEM technology enables a growth in the medical imaging field. Utilizing the GEM as a beta detector provides a unique method to locate residual tumors tissues. The GEM detector in this scheme works as an amplification tool, creating an electron avalanche through the ionization of gas. My focal point in this research is the chamber and its customizable geometry. The prototype GEM detector is a multi-layer detector, which includes many components that can vary in sizes. The objective of this study is to understand the construction of the GEM detector, and how it can play a role in medical physics.

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