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Garfield Simulation of Beta Particle Detection Emitted from Radiolabeled Peritoneal Tumors JOSHUA MEDFORD, AMIT BASHYAL, MINGWU JIN, YVONNE NG, RONALD MUSSER, TIMOTHY WATSON, ANDREW WHITE, JAE YU, Univ of Texas, Arlington — Secondary peritoneal carcinomatosis (PC) is one of the most lethal forms of cancer with little to no cure. Several different procedures ("Hot Chemo" and cytoreductive surgery) have been attempted in various ways with not much success. The University of Texas at Arlington high energy physics (HEP) group has been developing a highly efficient, high resolution sensor using the Gas Electron Multiplier (GEM) technology. A synergistic fusion of HEP and medical physics is ongoing to target high confidence identification and location of PC tumors to significantly improve the survival rate of PC. With the use of Garfield, a computer program designed for detailed simulation of two and three dimensional drift chambers that was developed by CERN, we plan to duplicate beta particles emitted from tumor tissue loaded with fludeoxyglucose (^{18}F-FDG) or copper-64 (radiolabeled biomarkers) that are then imaged by a small, triple GEM detector configuration setup. This simulation will lay a solid foundation for precise and accurate mapping of PC that enables physicians to target and eradicate it with minimally invasive procedures.

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