

Micro-RWELL Simulation Using Garfield++ and Geant4

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Introduction

Introduction

Cross-Check of
Geant4 and
Garfield++

Motivation

- This study aims to simulate the Micro-RWELL detector proposed by Dr. Kim as a fine-granularity detector for DAMSA.

Content

- Cross-validated the number of ionized electrons as a function of the incident electron energy using Geant4 and Garfield++.
- Investigated the avalanche gain distribution through Garfield++.

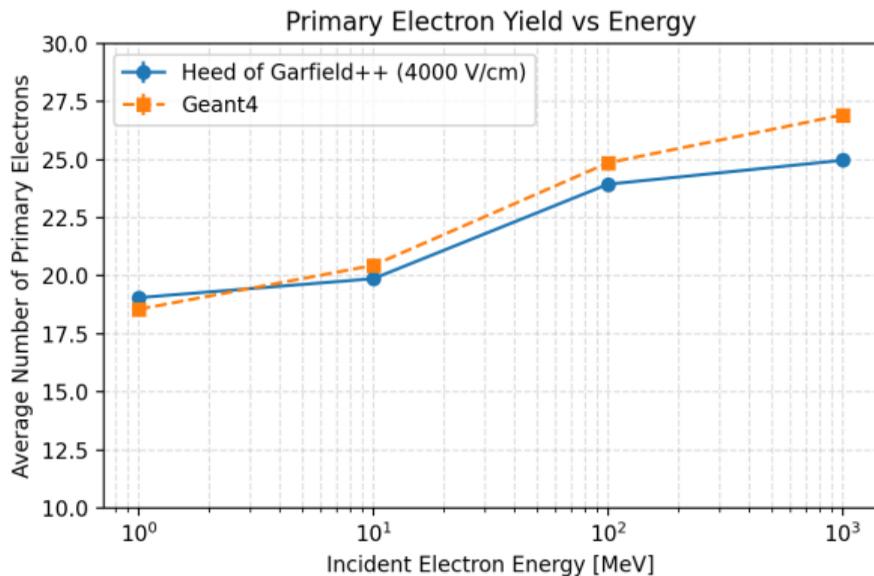




Cross-Check of Number of Ionized Electrons

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Slight difference due to kinematic energy threshold, physics model, electric field, etc.

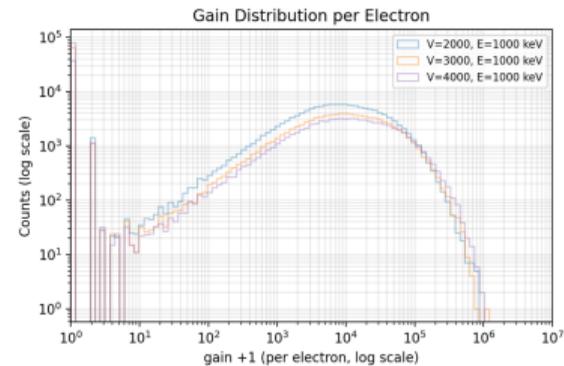
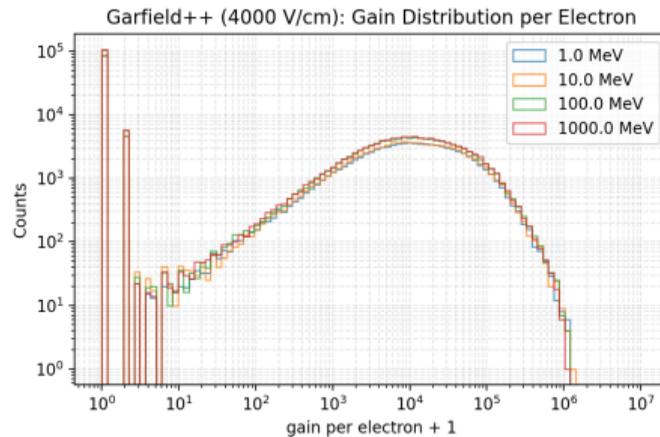




Distribution of Signal

Introduction

Cross-Check of Geant4 and Garfield++



Almost independent of incident electron's energy.

Electrons that fail to enter the holes show zero gain. However, it turns out that less than 3% of electrons actually fail to enter the holes. Therefore, I need to investigate why the proportion of zero-gain electrons is relatively high.

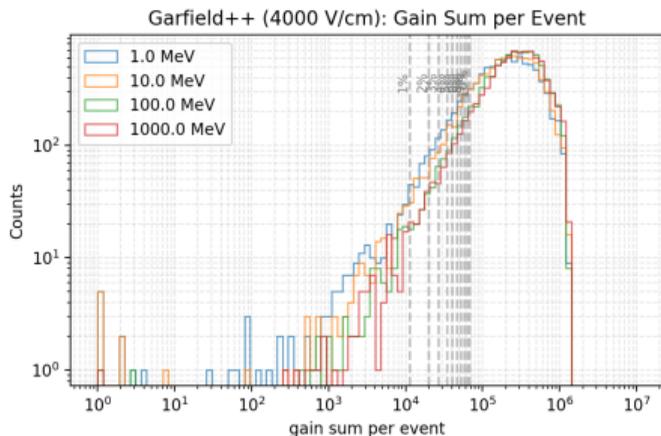




Distribution of Signal

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1%	2%	3%	4%	5%
1.132e+04	2.008e+04	2.696e+04	3.451e+04	4.087e+04
6%	7%	8%	9%	10%
4.659e+04	5.216e+04	5.813e+04	6.310e+04	6.765e+04

(a) Cut value for rejecting the lowest $n\%$ of events

By adding time information, I will calculate the signal current.
Afterwards, I will simulate the induced current profile on the strips.





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