LASPD Study

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New Simulation Method

- Discard "Photon Converting Profile"
- Discard "Energy Deposition Profile"
- Put 2cm LASPD in the simulation and shoot pi0 photons
- Let Geant4 take care of the converting and energy deposition for each event.
- In GEMC, add a feature to trace the source ("Mother") of the each events.
- For every photon in front of the SPD, I look at all particles inside the SPD and see if they were originally from the photon (itself+secondary particles).
- Add their energy depositions together and assign the sum to the photon as its overall energy deposition.

Correction:

The rate unit is actually only Hz (previously I treated it as Hz/cm2). The Edep went down to ~2GeV with my previus method (Don't scare this number! I have a much lower value!)

Adding the background

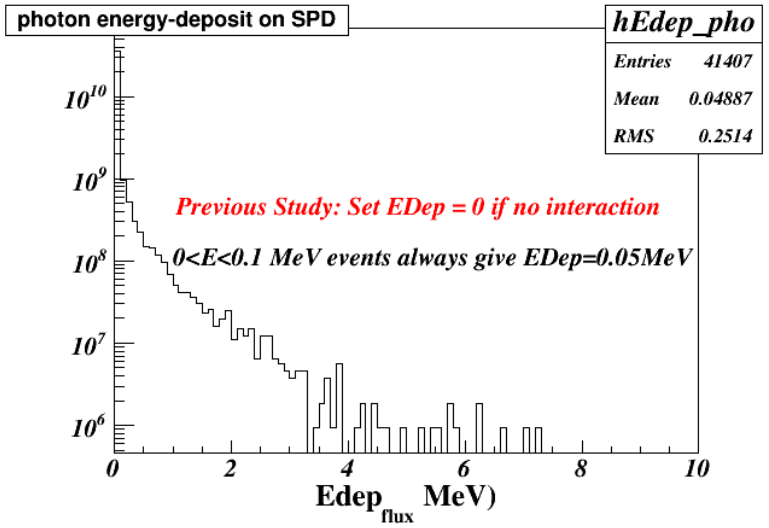
- Similarly, let Geant4 takes care of the converting and energy deposition (Edep)
- Calculate the total photon+electron rate for the entire LASPD plan (only apply the LASPD boundary cuts)

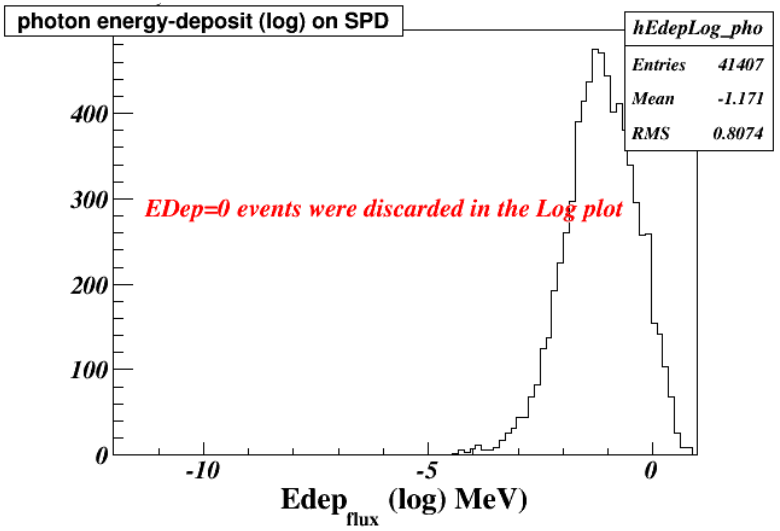
  Photon Rate ~ 38GHz, Electron Rate ~ 211 MHz
- Within 30ns --> #1153 Photon, #6 Electron
- Plotting the 1D-distribution of Edep on the entire LASPD plan for photons and electrons separately.
- Randomly pick Edep values for #1153 times for photons, and #6 times for electrons. Add these values together as Edep_background.
- Assuming the segmentation is #N, then the Edep for one high energy photon:

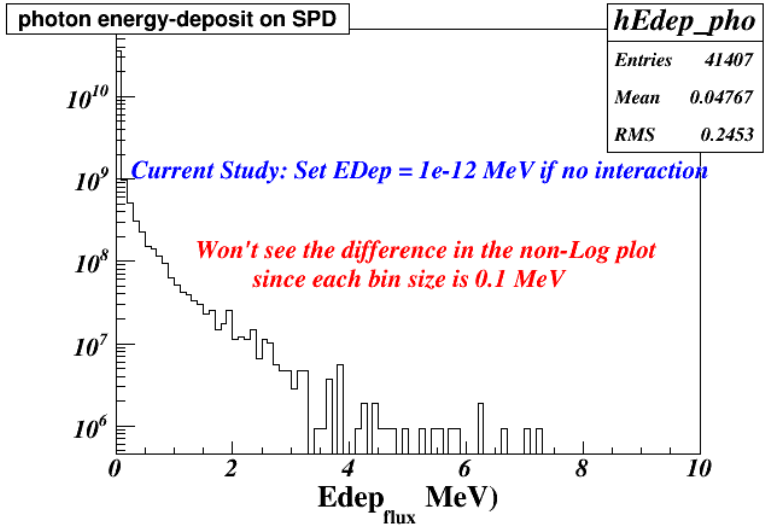
  Edep_each = Edep_itself + Edep_background/N

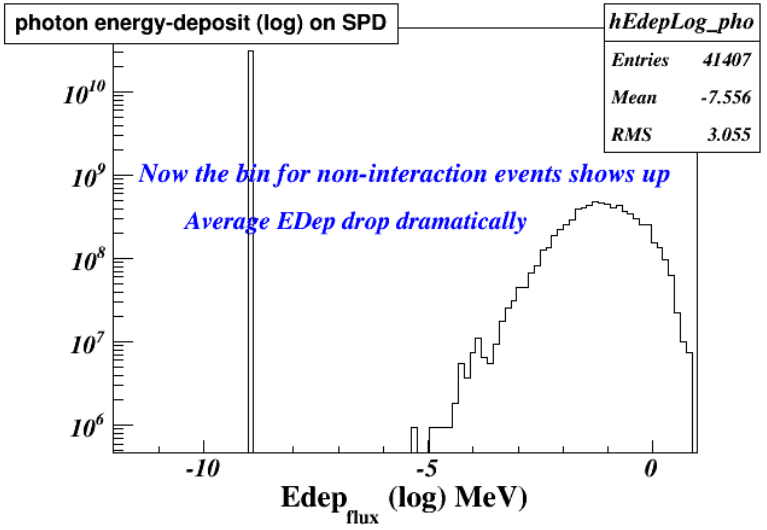
Previous Issues

- This method should roughly give the similar results as I did before. However, I do discover why the previous study give HUGE Edep





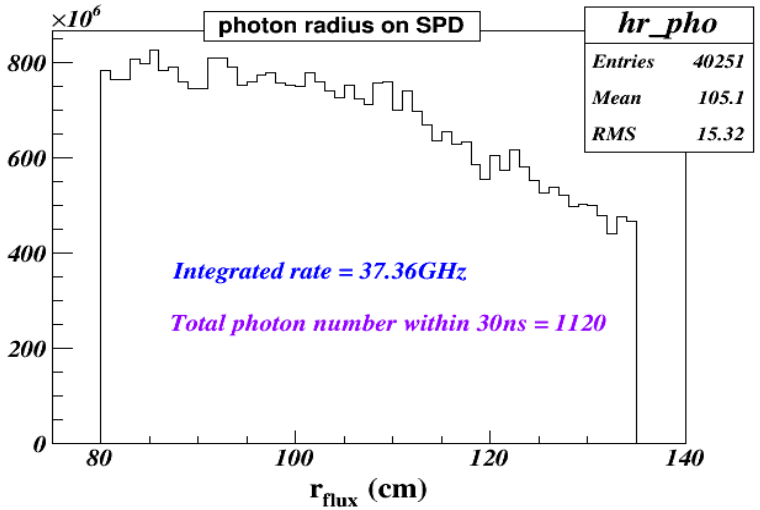


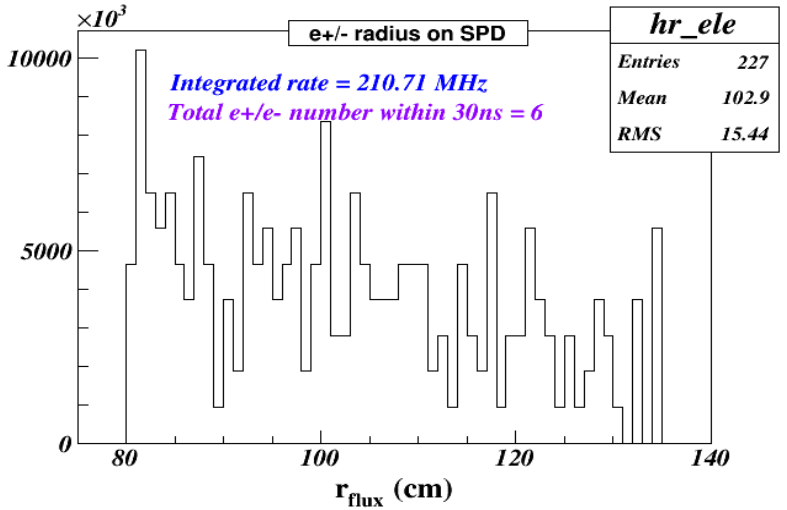


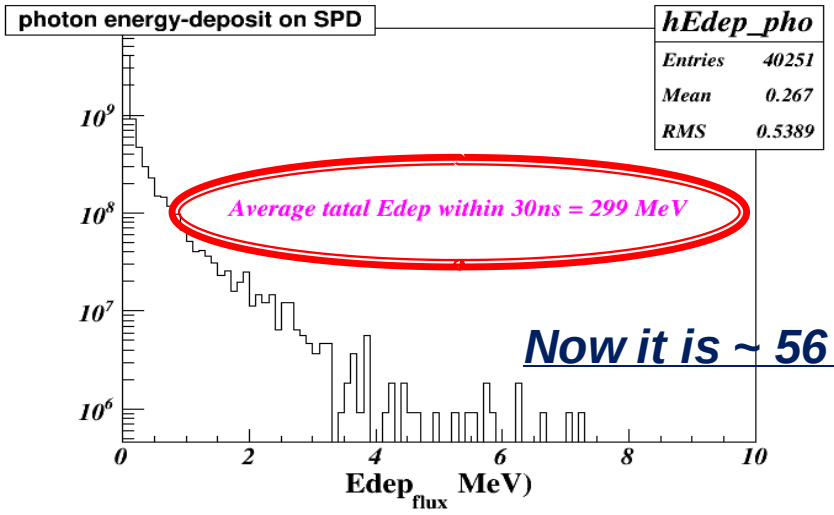
So it is a binning issue!!!

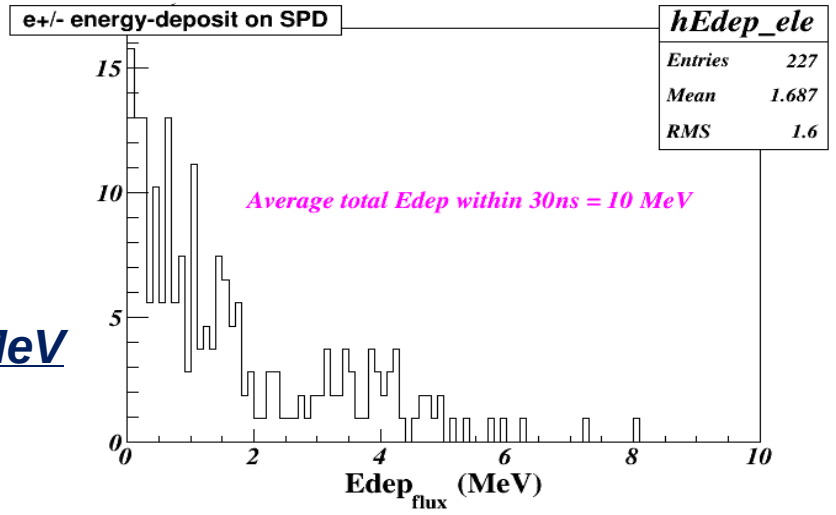
Previous Issues

- This method should roughly give the similar results as I did before. However, I do discover why the previous study give HUGE Edep values.







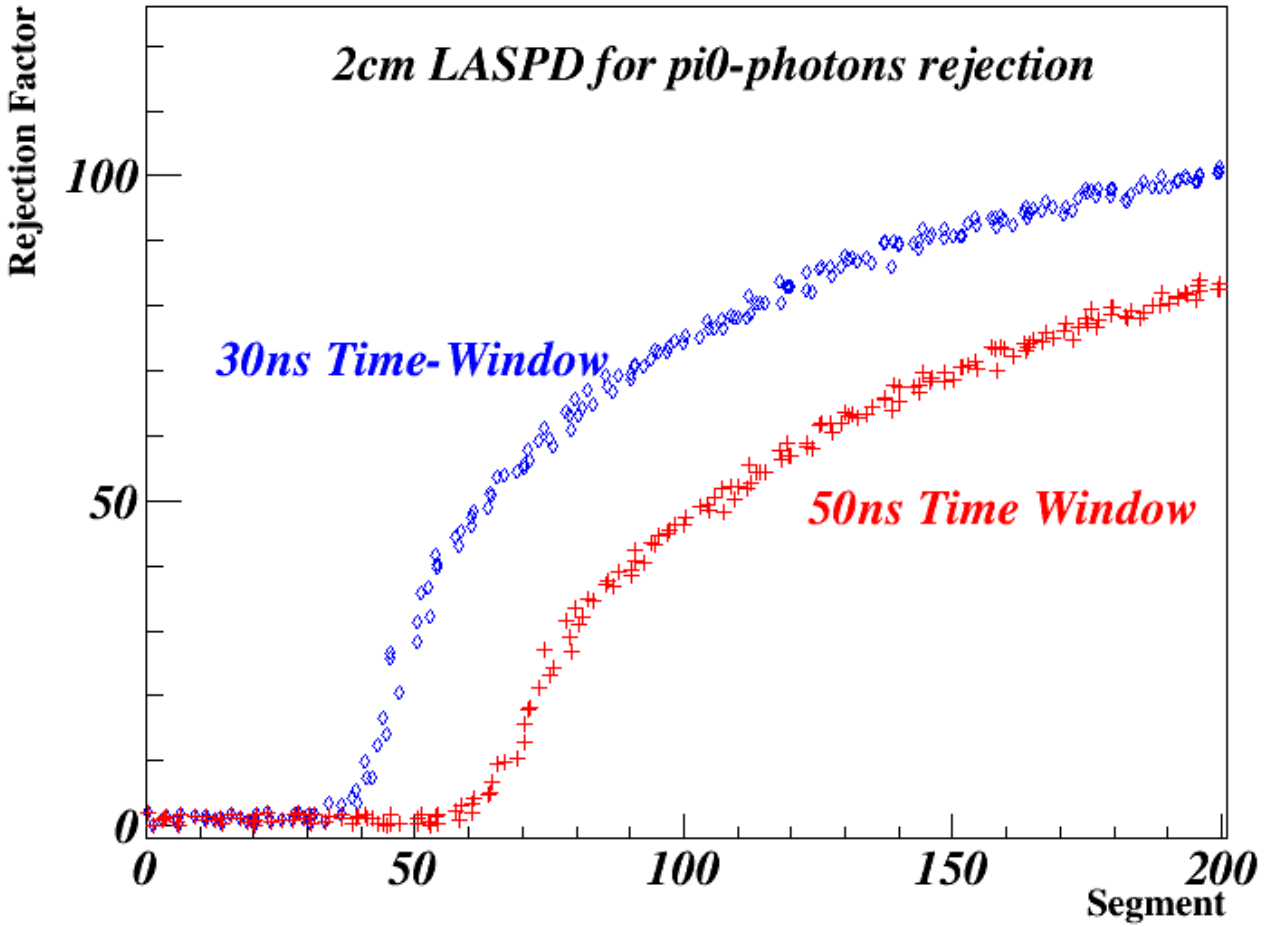


Now it is ~ 56 MeV

Segementation

- Assuming the segmentation is #N, then the Edep for one high energy photon:

Edep_each = Edep_itself + Edep_background/N



Rejection Factor = N_Total/N_Fire