

SNS US-Japan Meeting

Li-Cheng, FENG

WCSim Simulation

ID Diameter : 3m

IDHeight : 2m

Cathod coverage : [7.5, 15, 30, 60, 78]%

3-inch PMT numbers : [488, 999, 1984, 3956, 5056]

QE: same as 20-inch

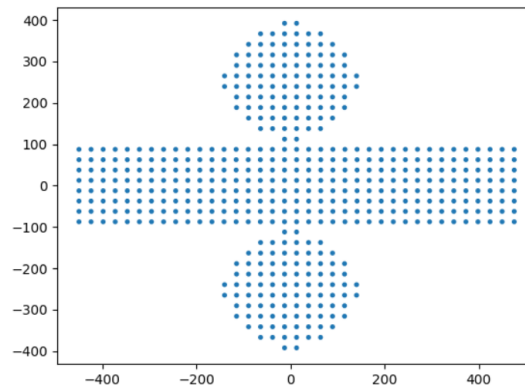
Input particle : gamma

Direction: Uniform

Position : Uniform

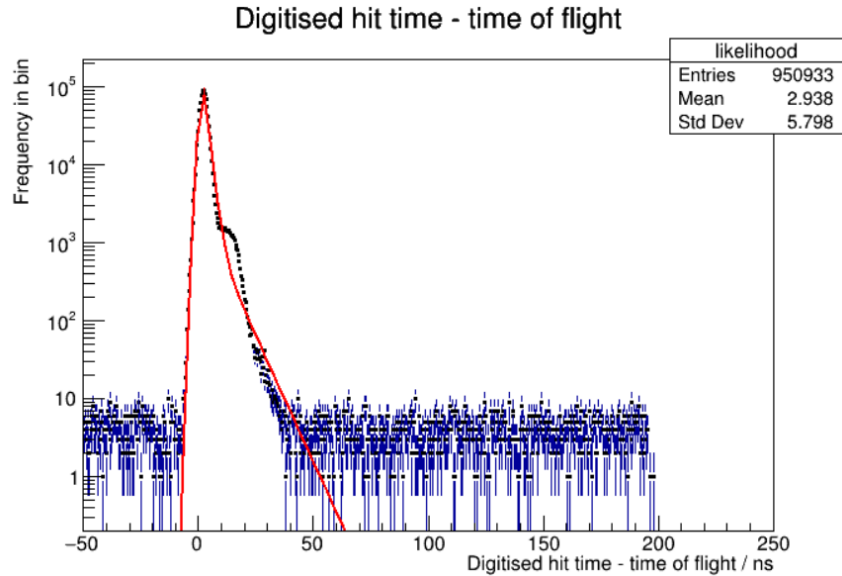
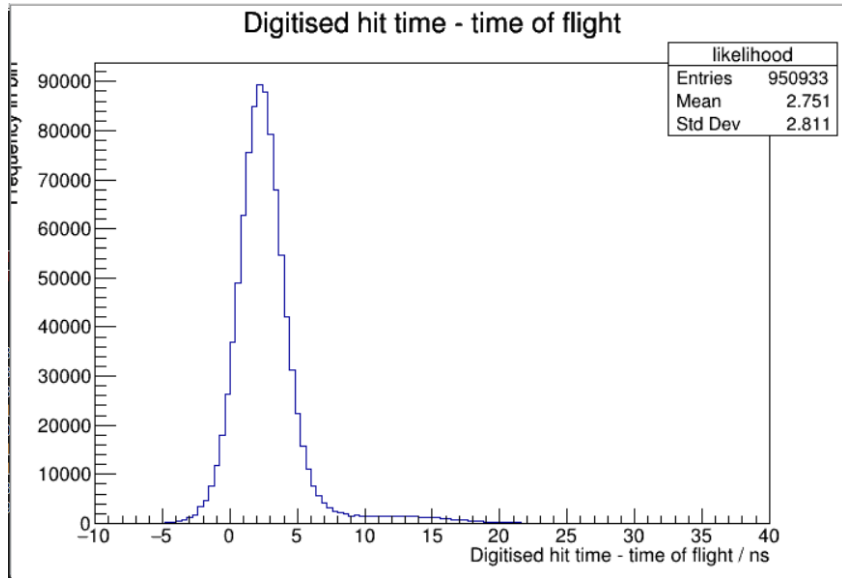
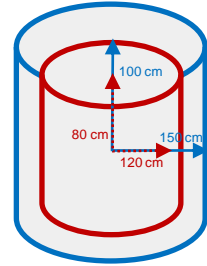
MC Statistics: 10,000 event

coverage 7.5% #448 PMT



Vertex Reconstruction, WCSim, Bonsai

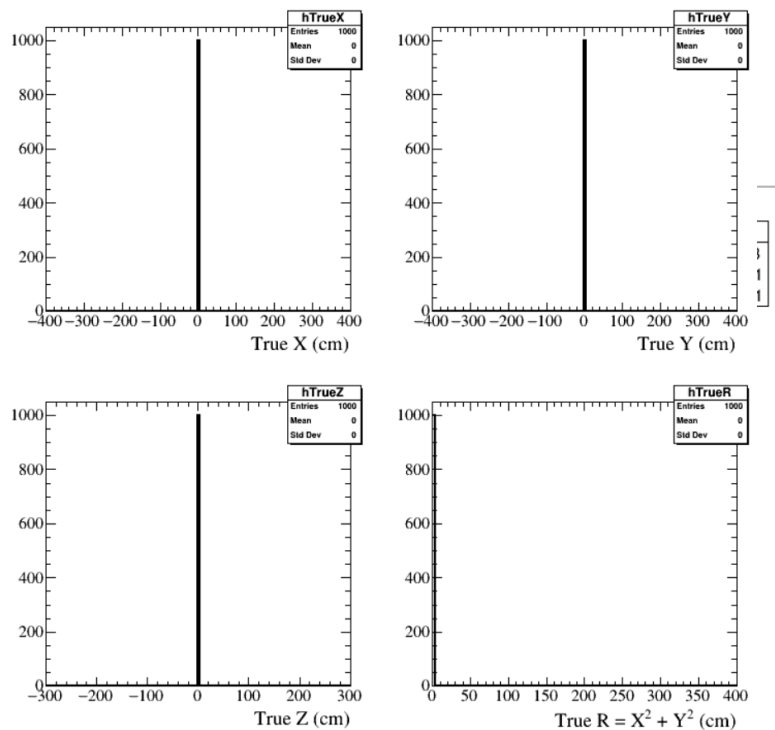
Create T-TOF PDF for the 3m x 2m detector (pc: 78%)



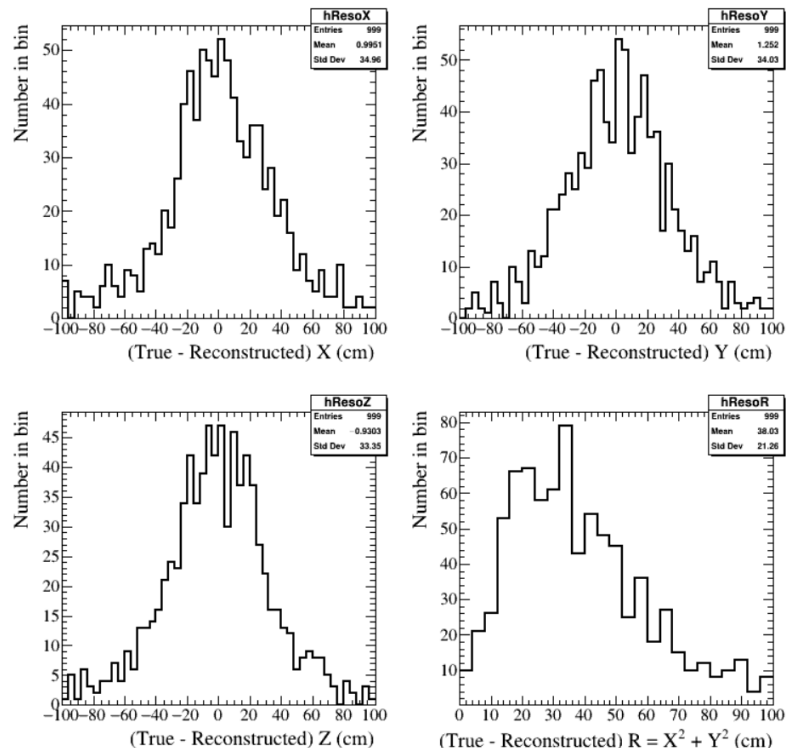
WCSim, Bonsai, e⁻ 10 MeV , Position (0, 0, 0), Direction: Uniform



MC Truth



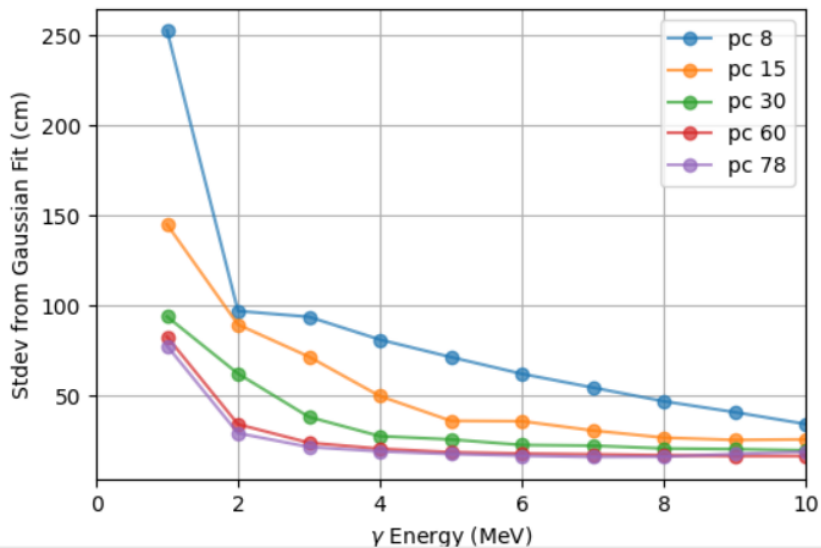
Reconstructed



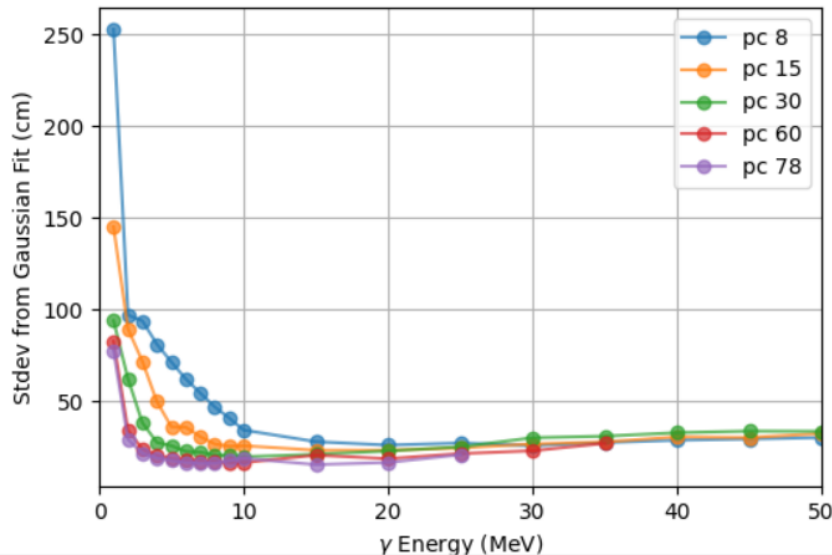
Vertex Resolution



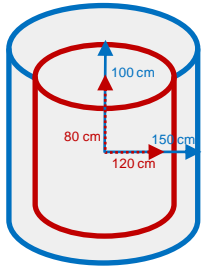
3m radius 2m hight cylinder
vertex resolution



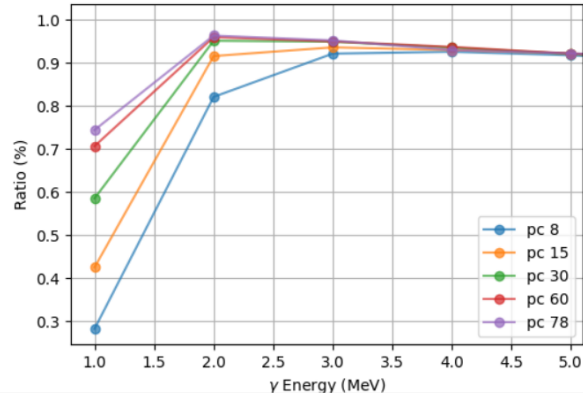
3m radius 2m high cylinder
vertex resolution



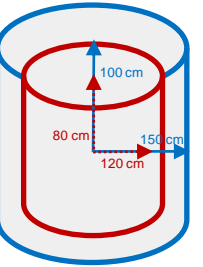
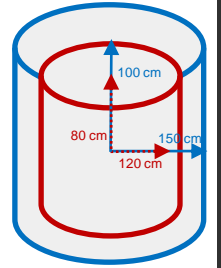
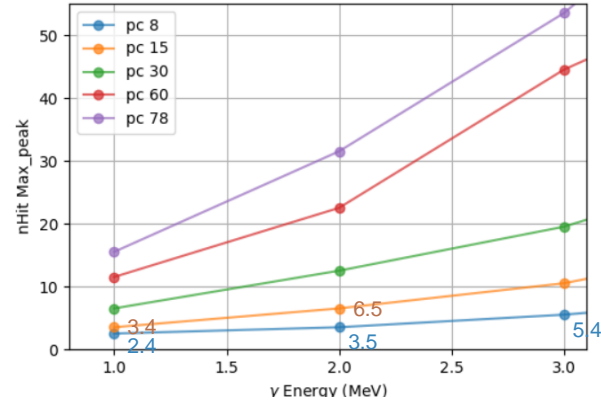
Take aways



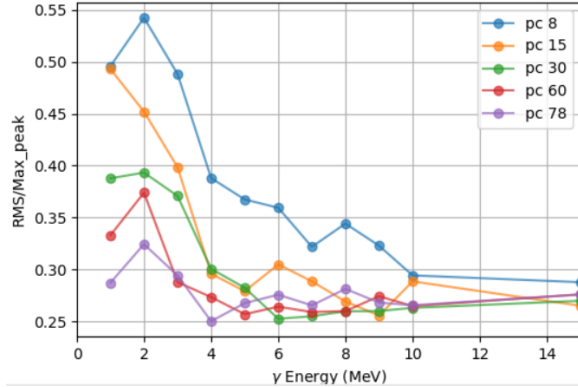
Success full hit ratio



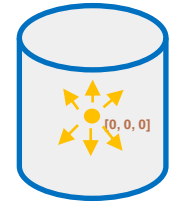
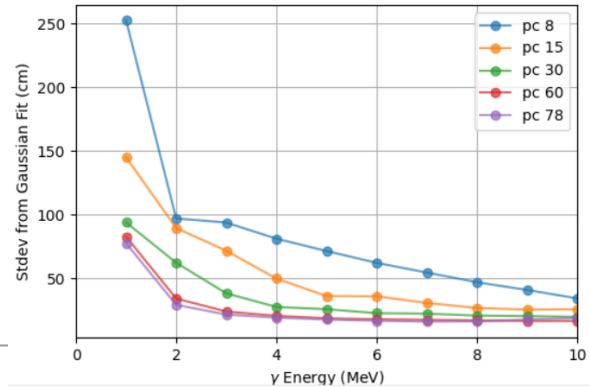
nHit peak distrubution



Energy Resolution



Vertex Resolution

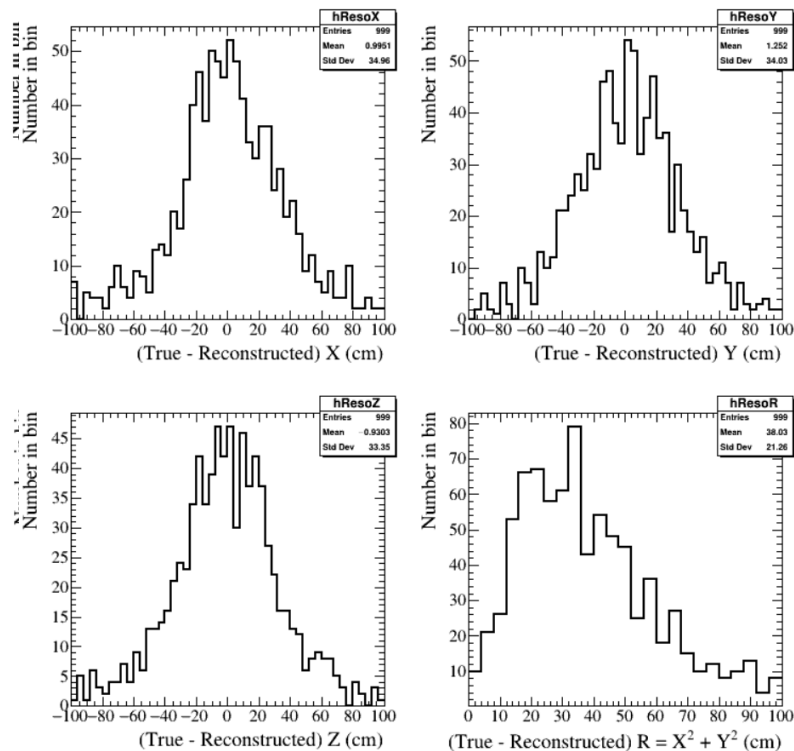
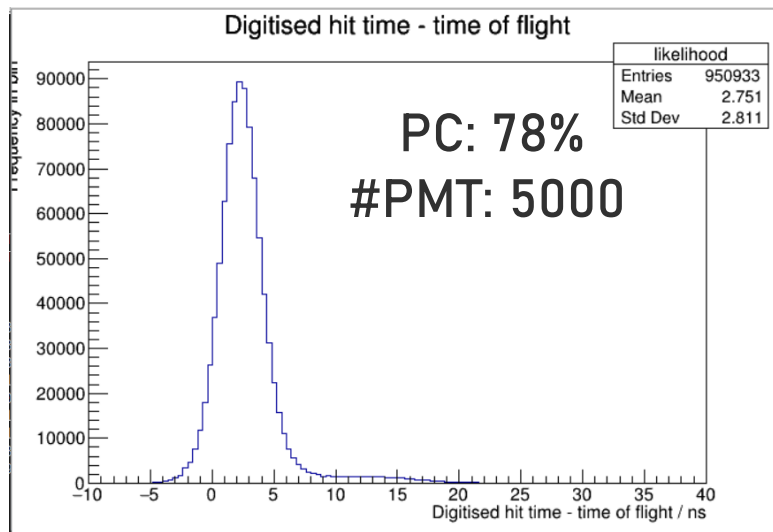


Backup

WCSim, Bonsai, e⁻ 10 MeV , Position (0, 0, 0), Direction: Uniform

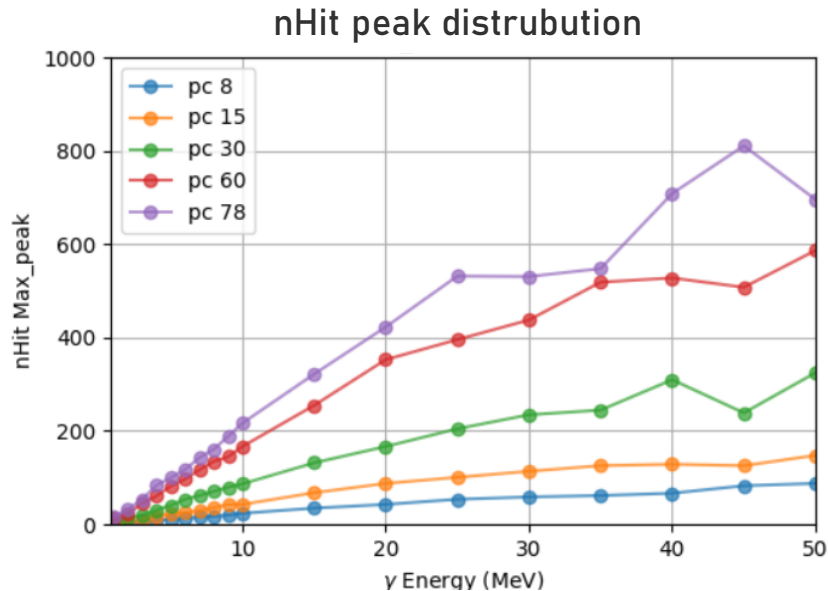
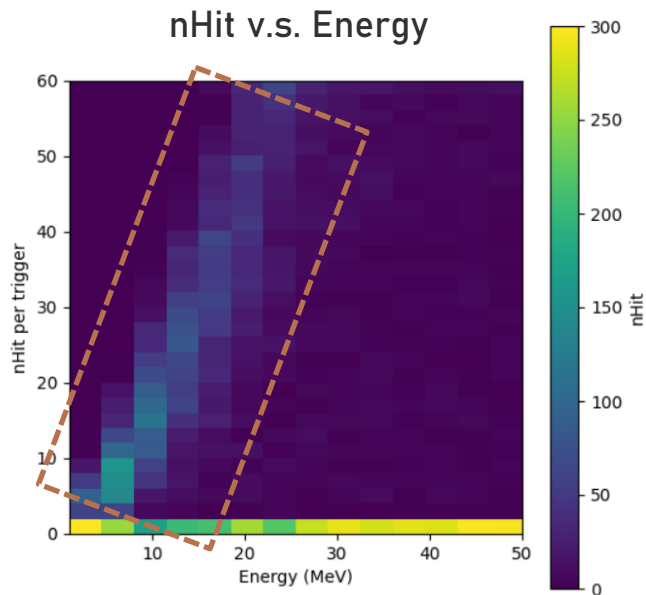
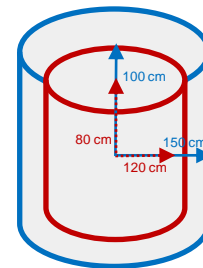
Reconstructed

PDF using



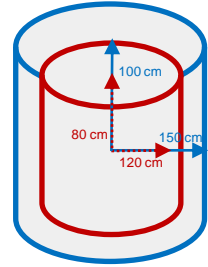
WCSim Simulation

(P.S with fiducial volume cut [radius -30cm, height -20cm])

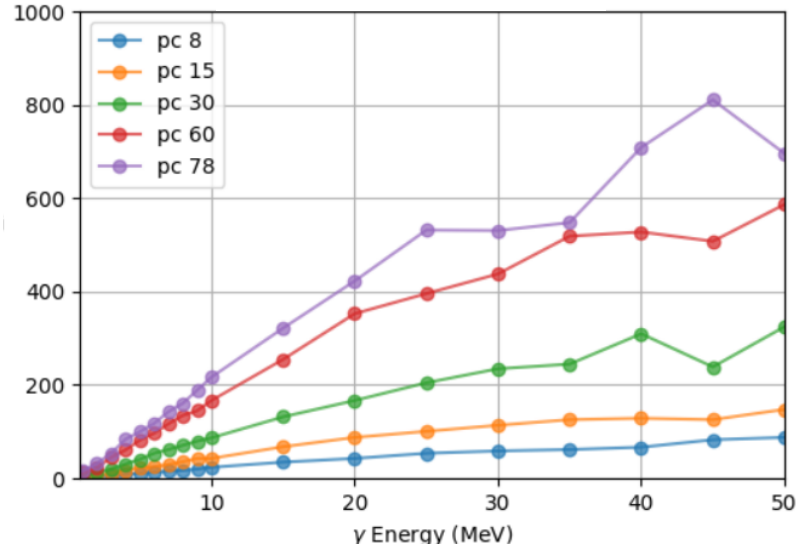
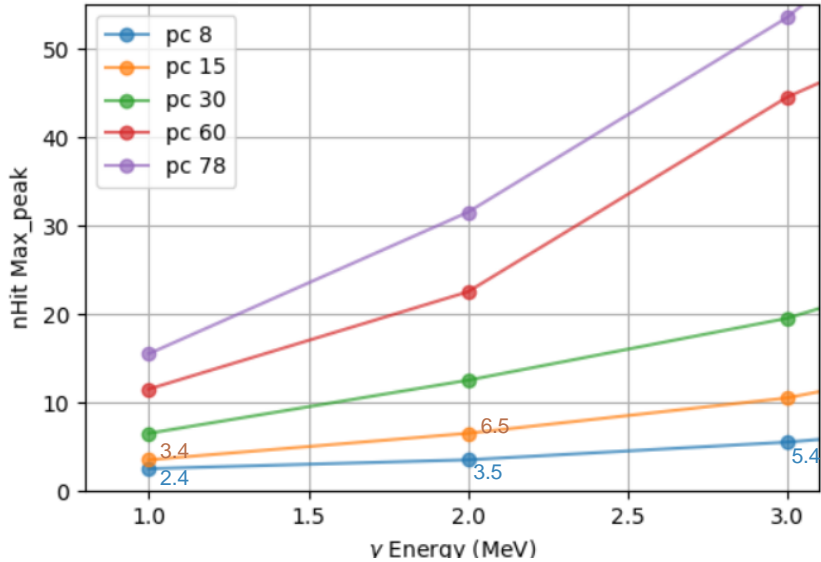


WCSim Simulation

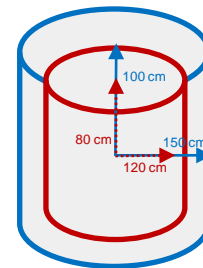
(P.S with fiducial volume cut [radius -30cm, height -20cm])



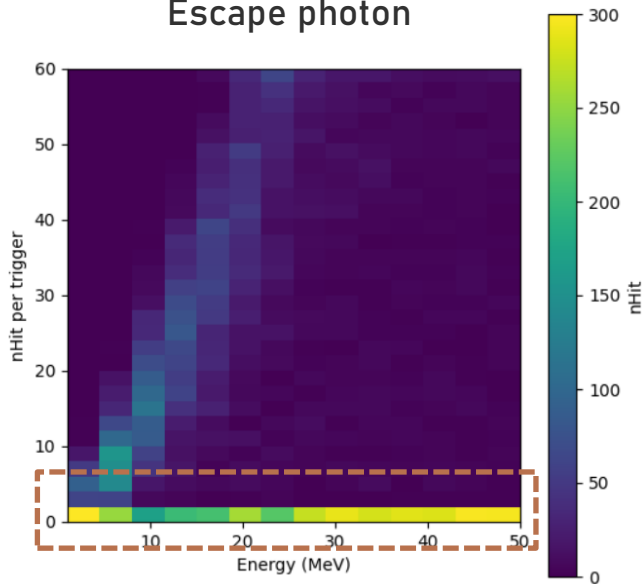
nHit peak distribution



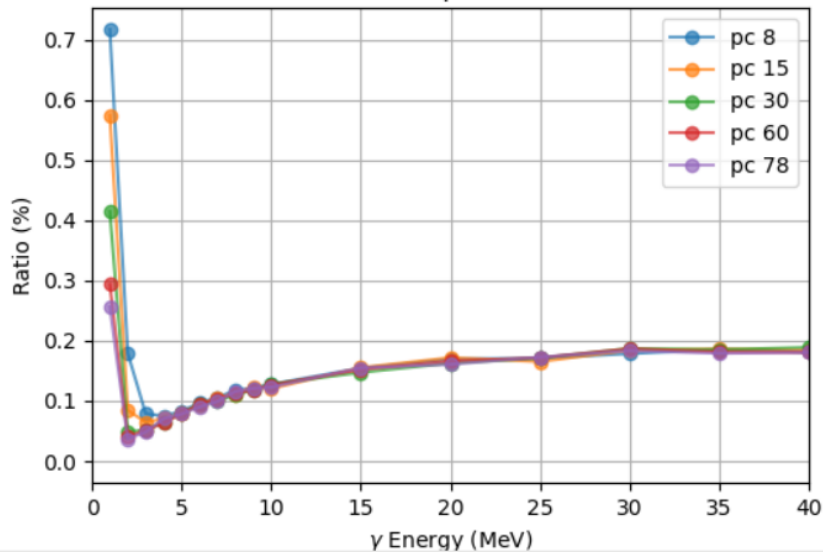
WCSim Simulation



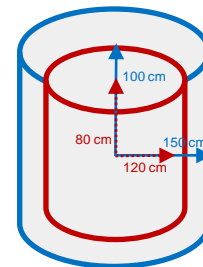
Escape photon



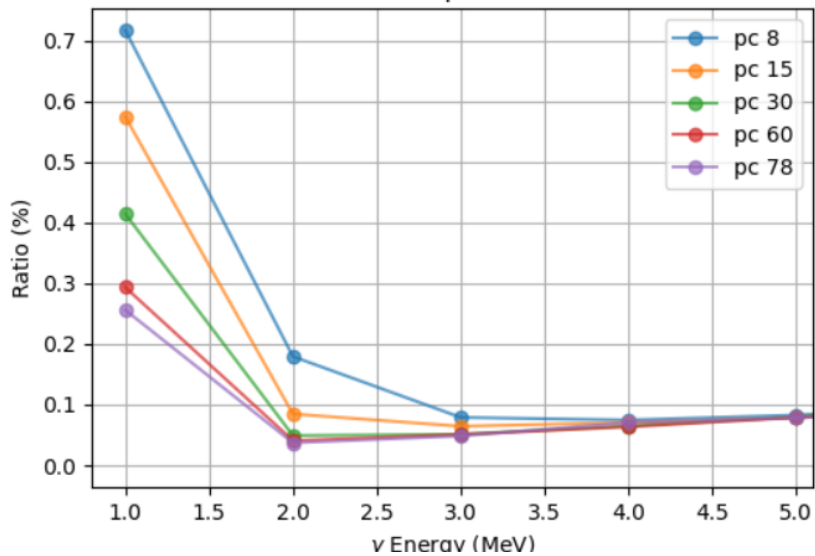
3m radius 2m high cylinder Escape hit



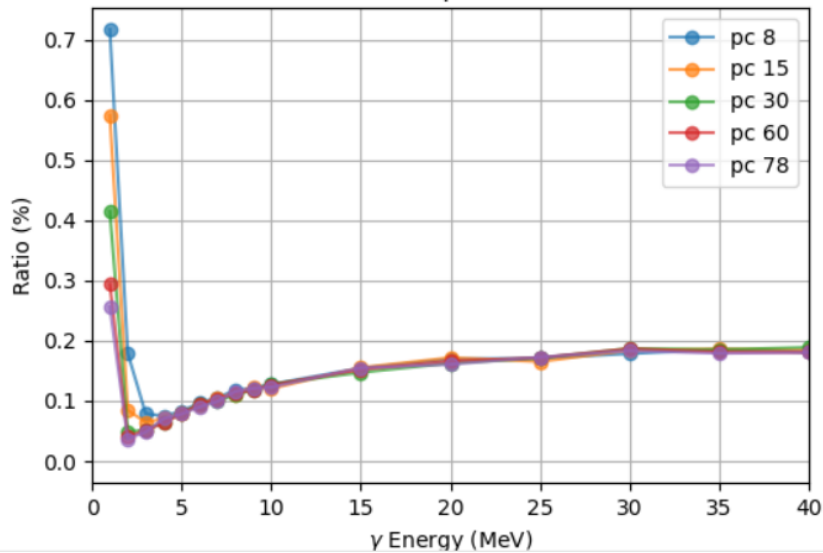
WCSim Simulation



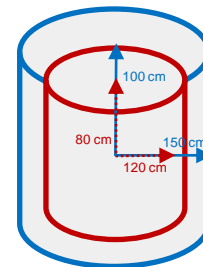
3m radius 2m high cylinder
Escape hit



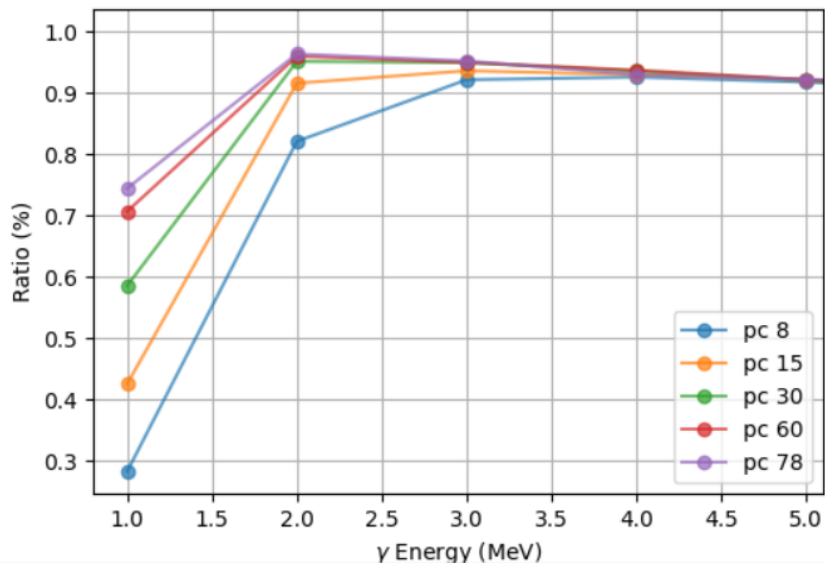
3m radius 2m high cylinder
Escape hit



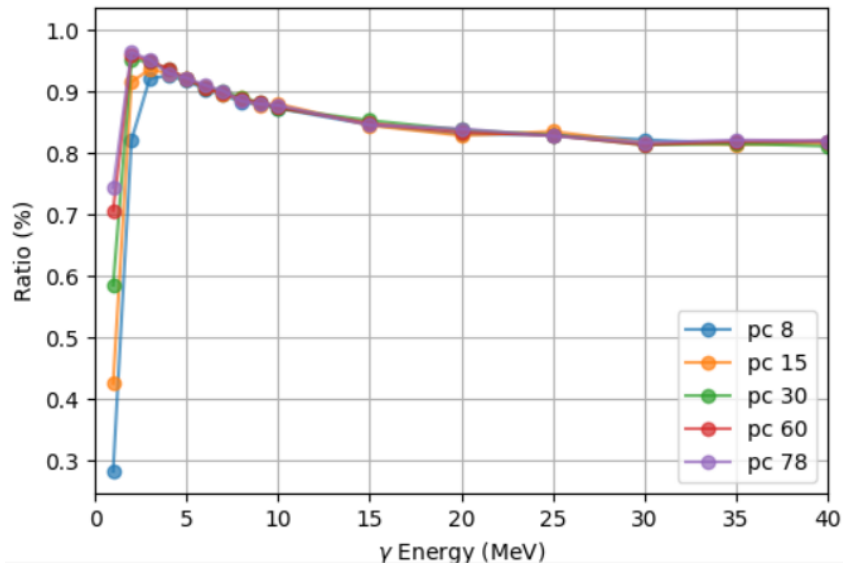
WCSim Simulation



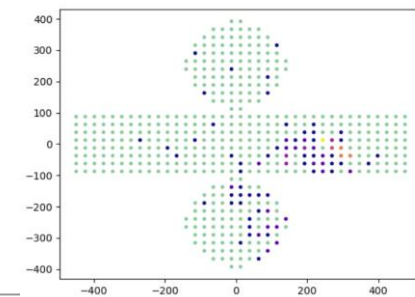
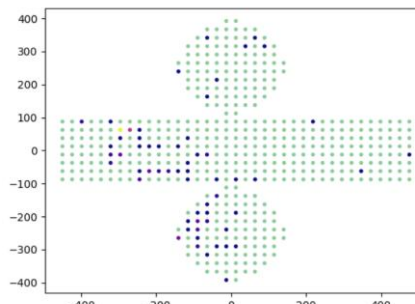
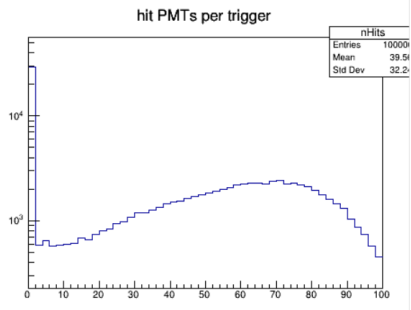
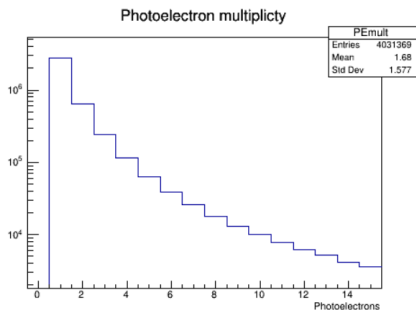
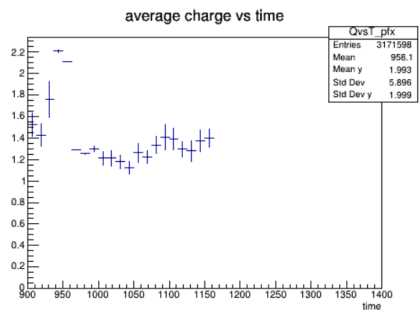
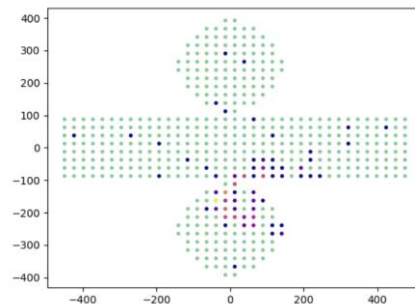
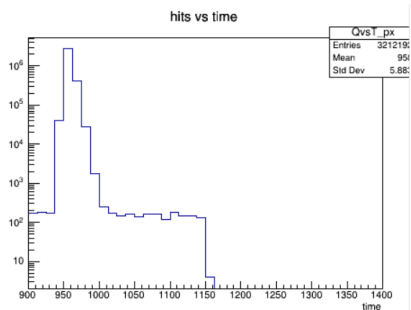
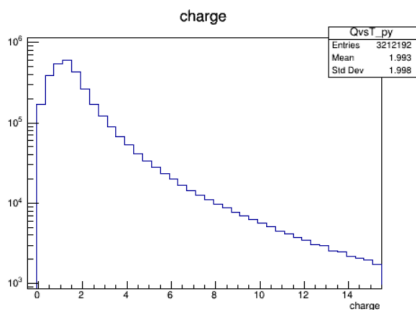
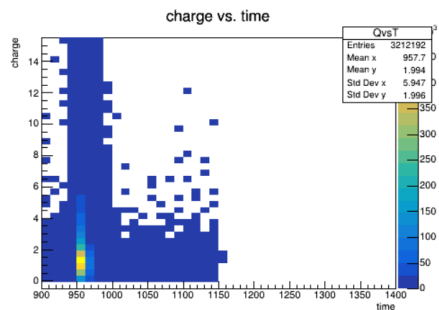
3m radius 2m high cylinder
Successful hit



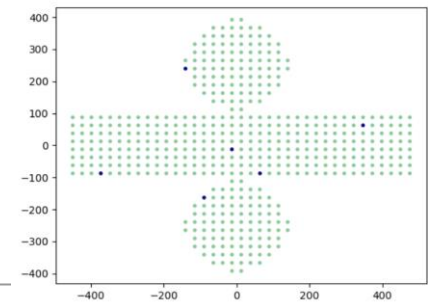
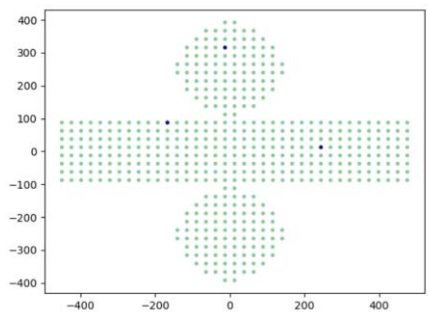
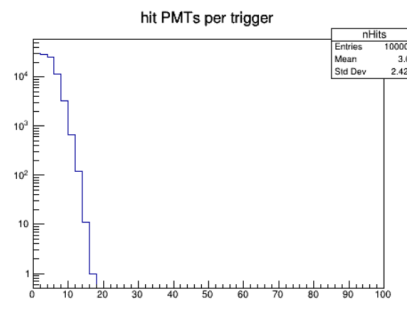
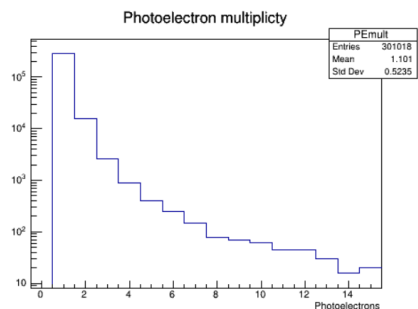
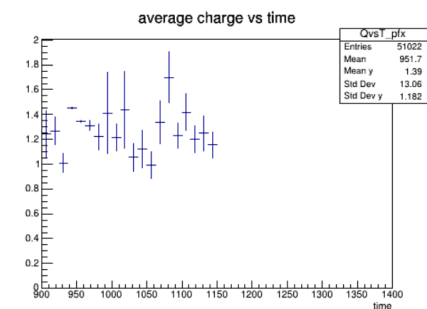
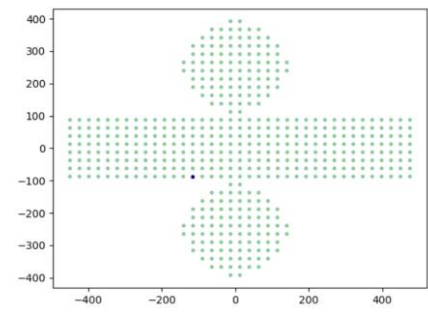
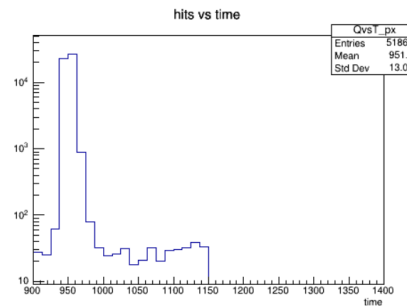
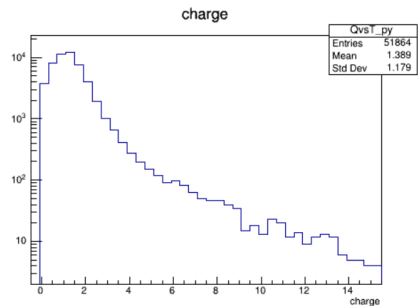
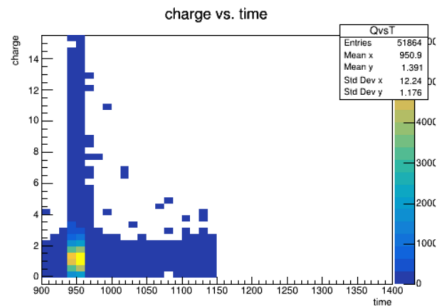
3m radius 2m high cylinder
Successful hit



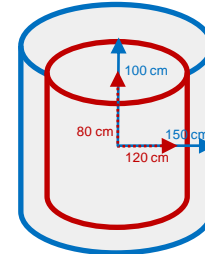
Input gamma energy : 40MeV



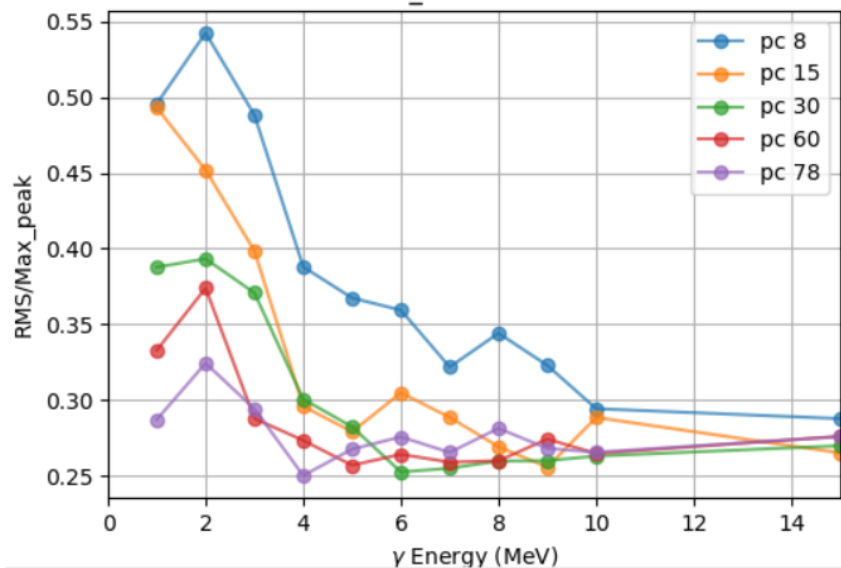
Input gamma energy : 2.2MeV



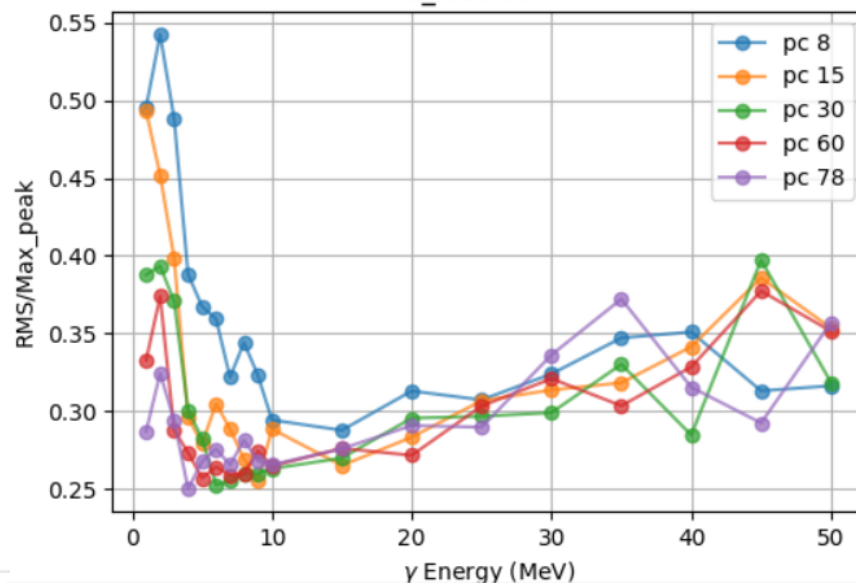
Energy resolution : RMS / nHit Peak



3m radius 2m high cylinder
E_resolution

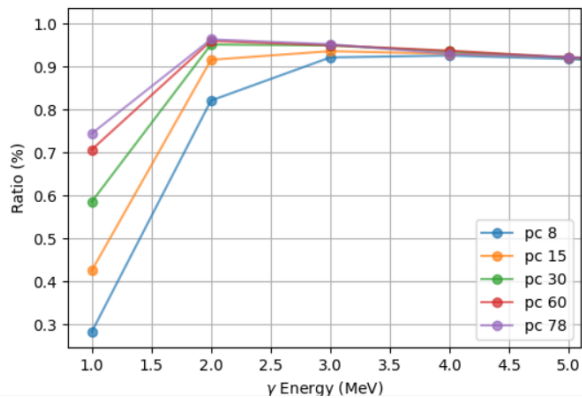


3m radius 2m high cylinder
E_resolution

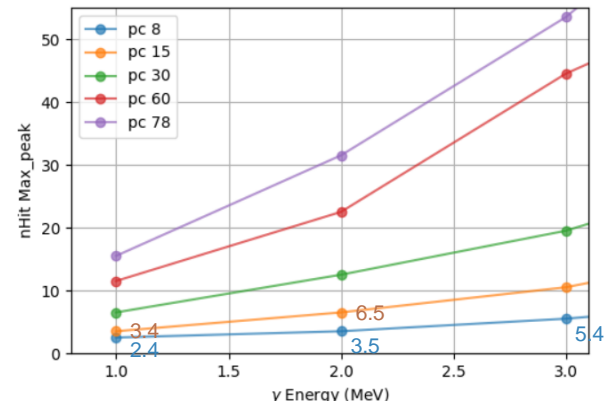


Take aways

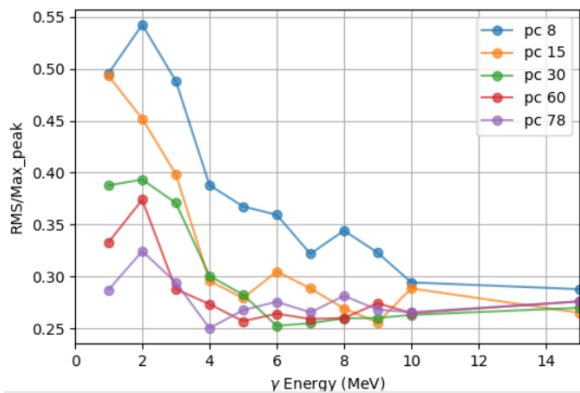
Success full hit ratio



nHit peak distribution



Energy Resolution



Vertex Resolution

