

MPGD Digitization

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MPGD Digitization

Simulated Hit

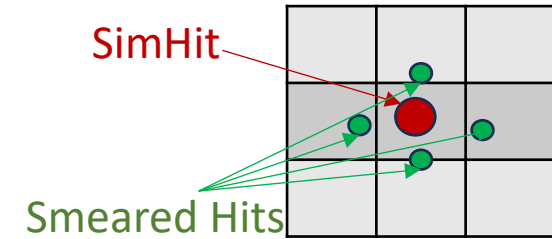


Digitized Hit

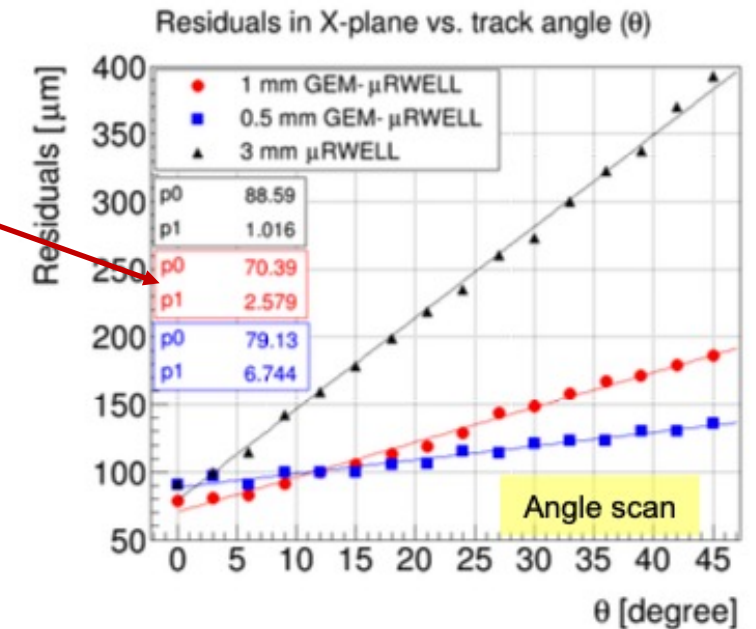
- Cell ID
- Position (x,y,z)
- Energy Deposited
- Charge
- Time Stamp

- Gaussian Charge Smearing
 - > Gaussian parameters are determined from the test beam data
 - > Only simulated hit, no background noise
- Energy/Charge deposited in neighboring cells
- Cell Positions (x, y, z)
- Cell IDs

- Developing test algorithm for digitization



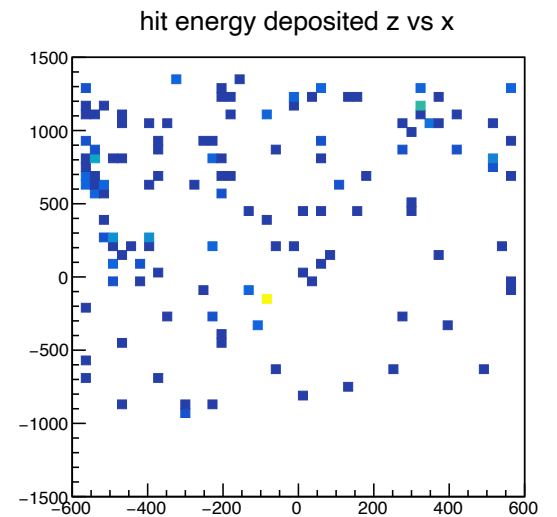
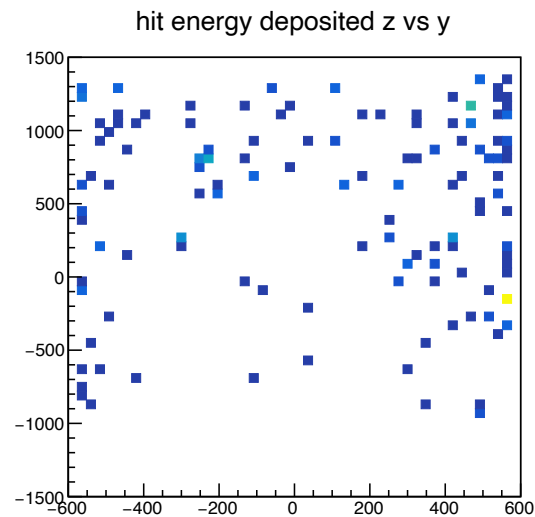
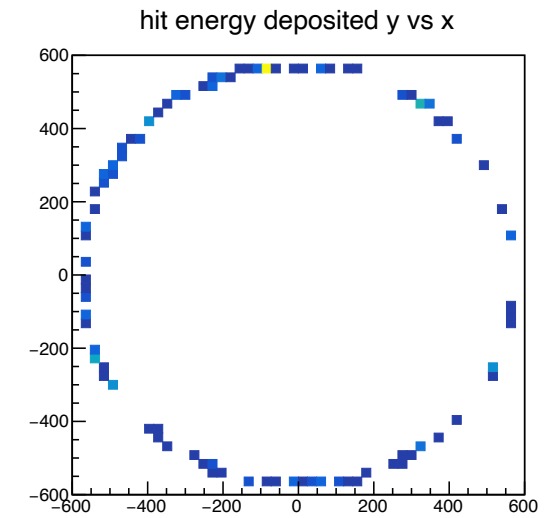
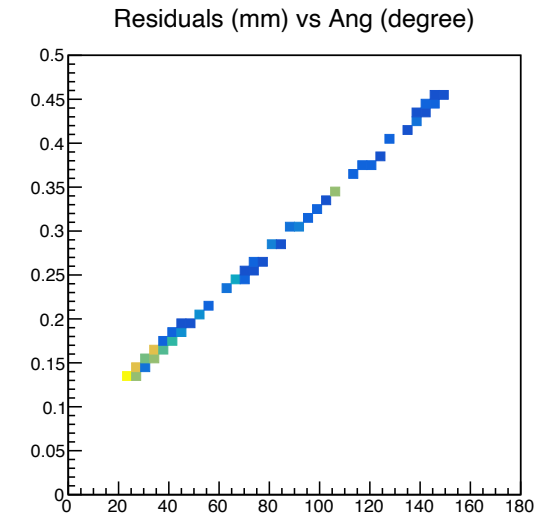
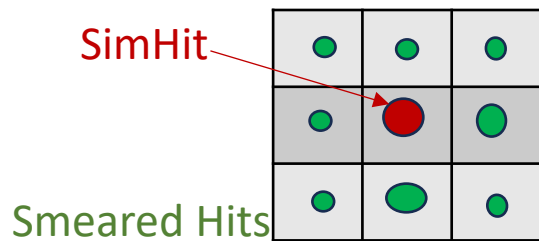
Smearing parameters



Test beam data with parameterization

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- ❑ 100 Events using
ddsim(pythia8NCDIS_10x100_minQ2=1_beamEffects_xAngle
=-0.025_hiDiv.edm4hep.root)
 - ❑ MPGDBarrelHits
- ❑ Physical hit info using CellIDConverter
 - ❑ $r = \sqrt{x^2 + y^2 + z^2}$
 - ❑ $\theta = \arccos(z/r)$
 - ❑ Cell dimension = 0.052 (mm) x 0.052 (mm)
- ❑ Resolution (Residuals) = $(70.39 + 2.579 * \theta) * 0.001$ mm
 - ❑ Test beam data parameters for 1 mm drift gap
- ❑ Working on:
 - ❑ Finding neighboring cells
 - ❑ Using cell dimension to find nearest neighbor around the cell that has a hit
 - ❑ Gaussian smearing in the neighboring cells
 - ❑ Gaussian mean -> Center of the cell (?)
 - ❑ Gaussian Width -> ? (residuals?)



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