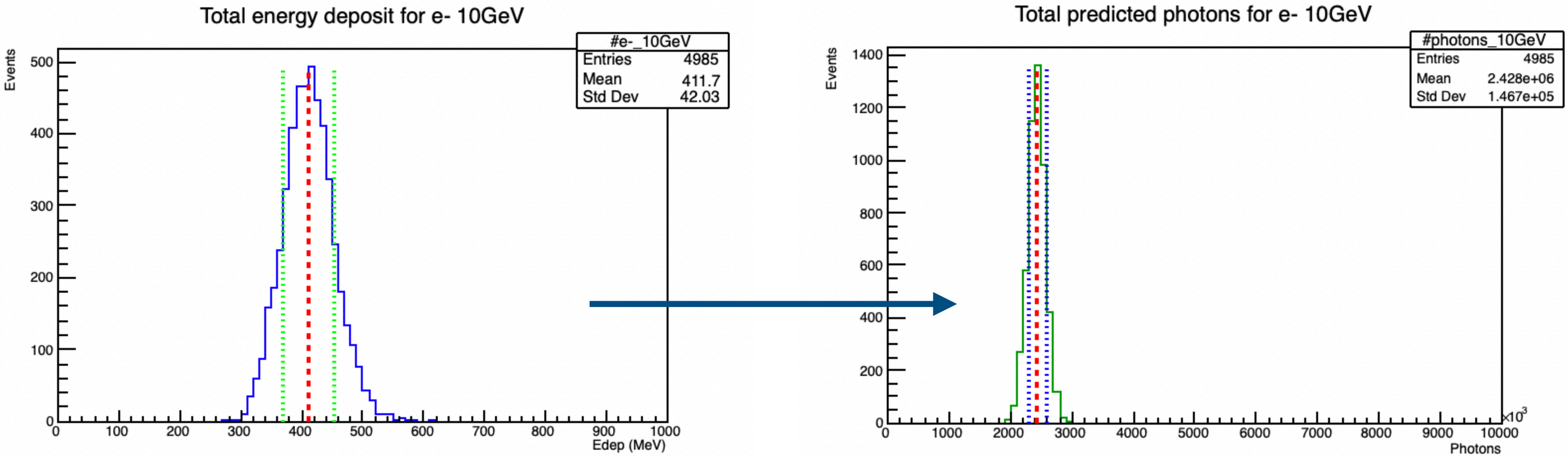
# SND configurations

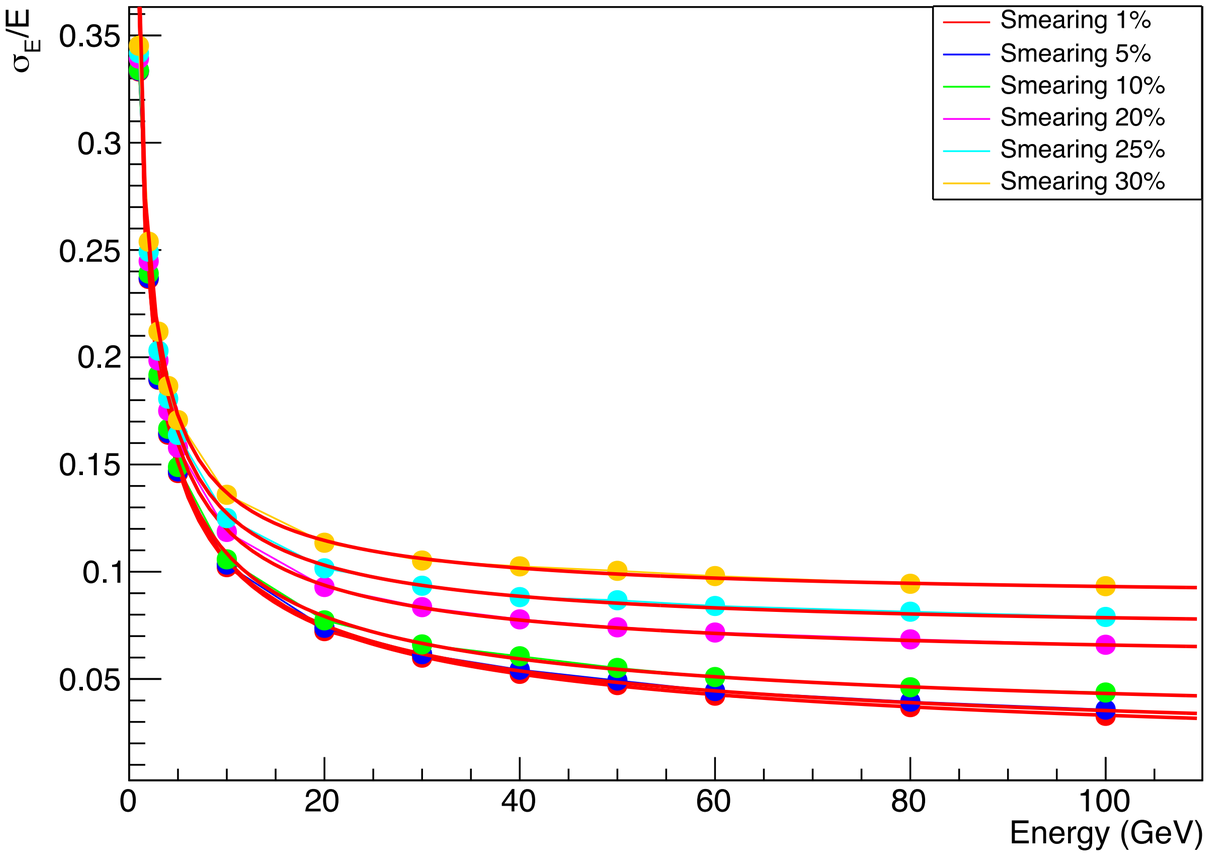
Vasilisa Guliaeva

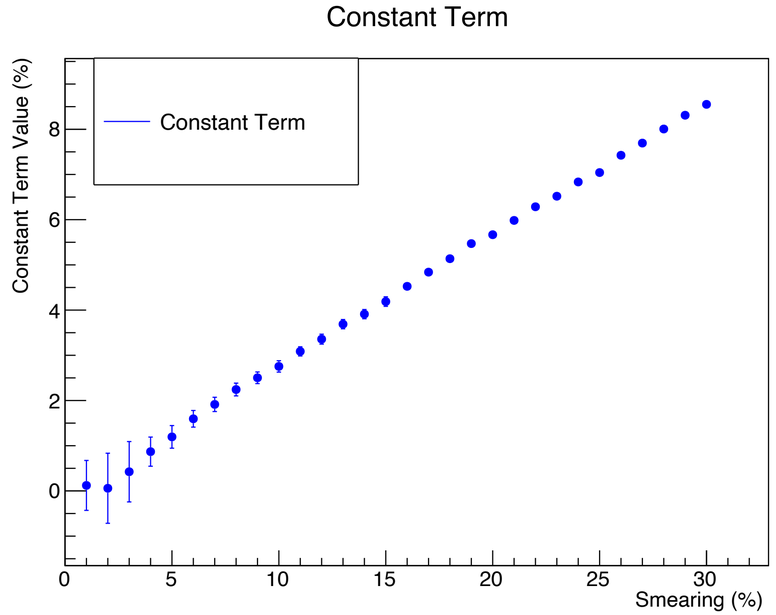


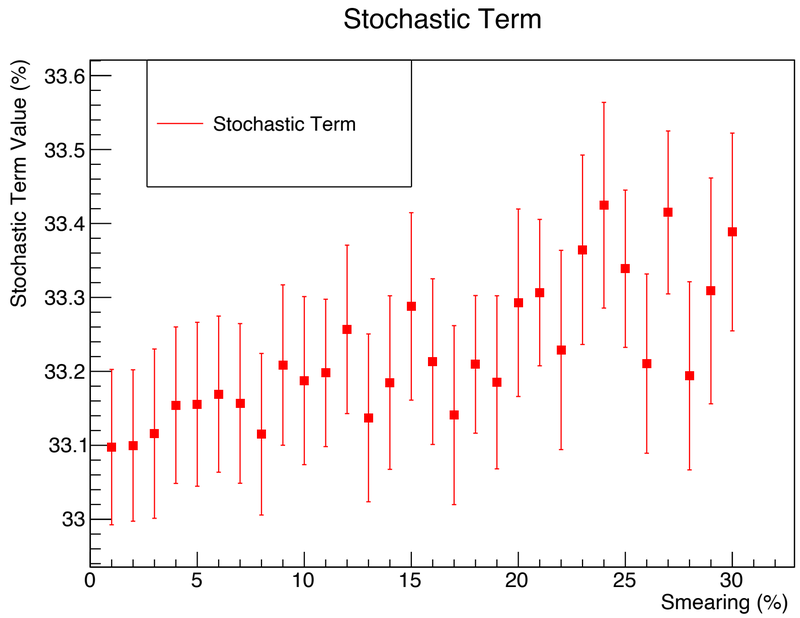

- Electrons with energies ranging from 1 GeV to 100 GeV.
- The energy deposited in the scintillating tiles was converted into the number of scintillation photons produced, taking into account Birks' Law.

# electron Resolution

1.5 cm Sci
5 cm Fe

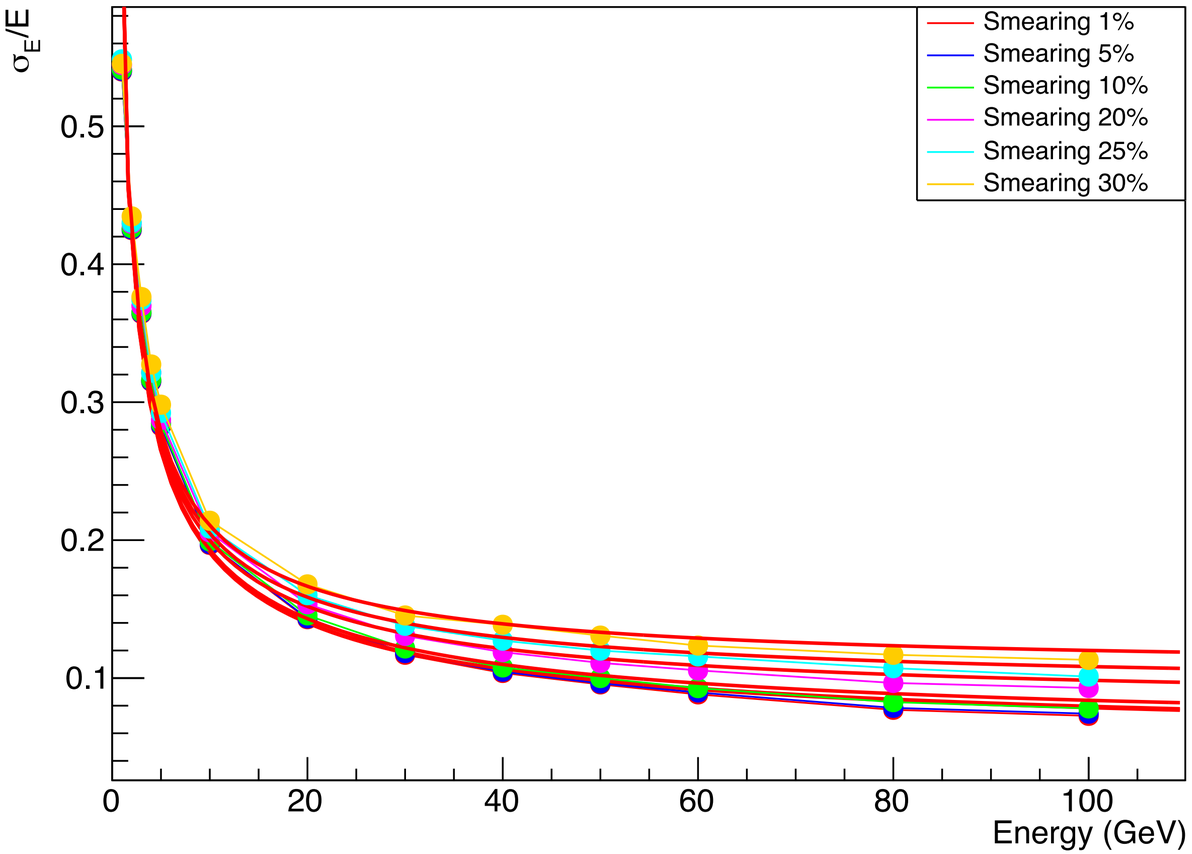



- Applying this Gaussian approximation for the LC smearing, we estimated its contribution to the stochastic and constant terms of the energy resolution.
- Constant (blue points) and stochastic (red points) terms as a function of the $\sigma$

pion

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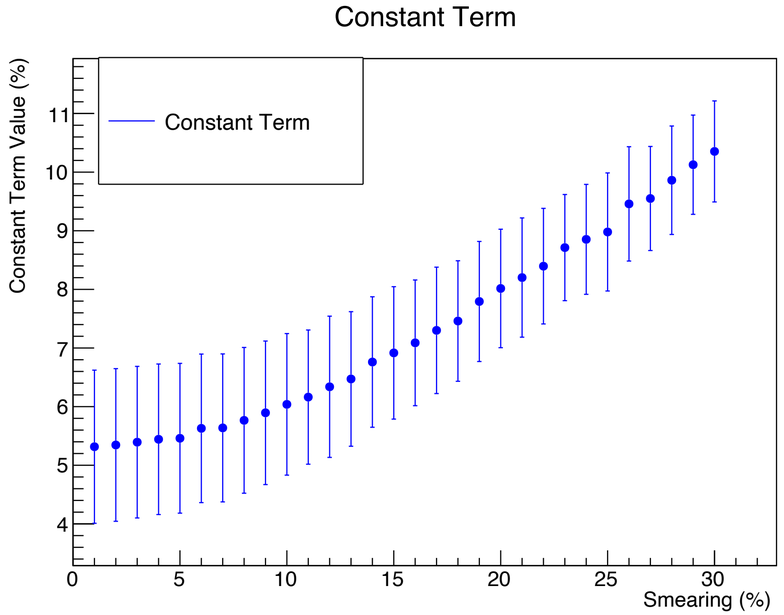
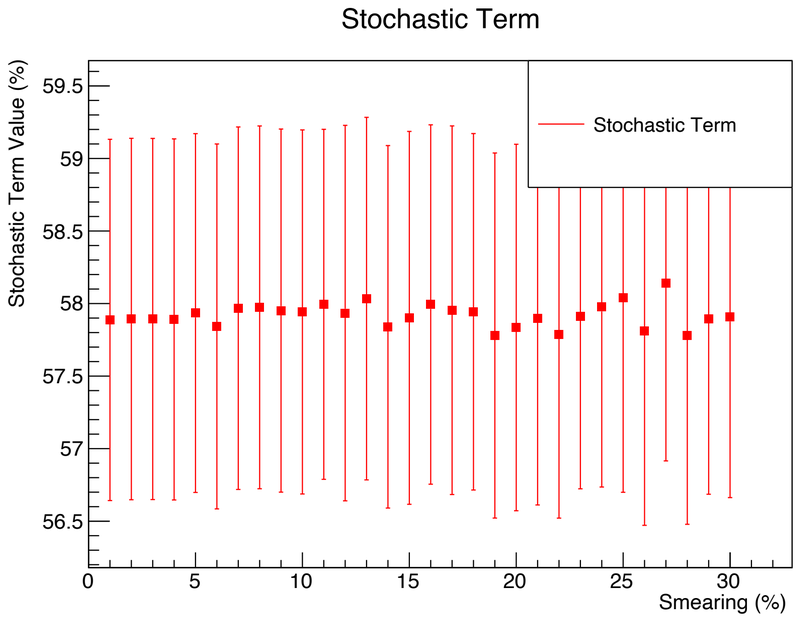
5 cm Fe

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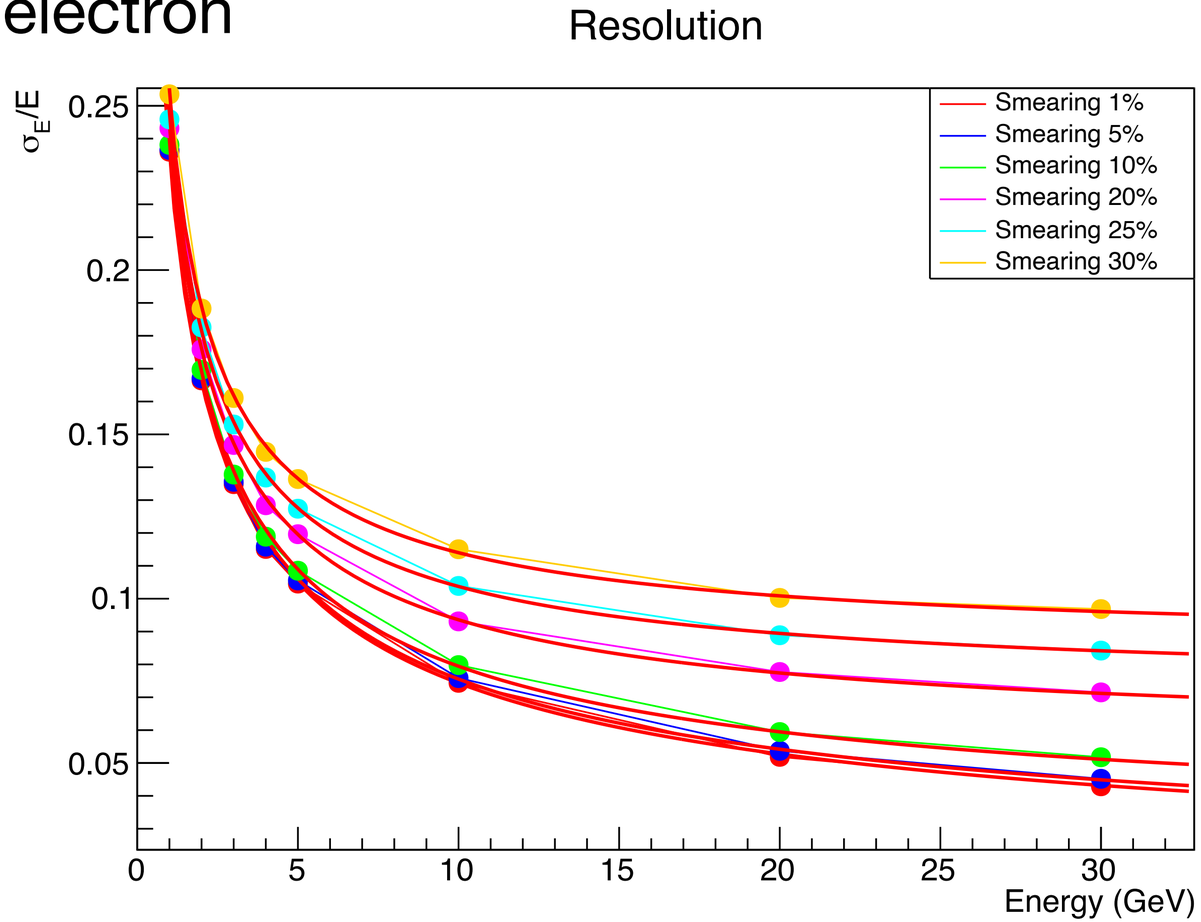
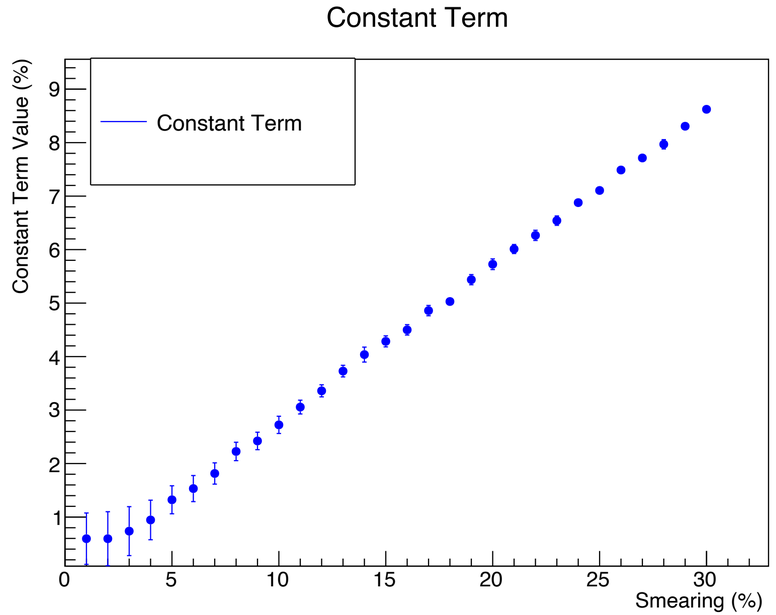
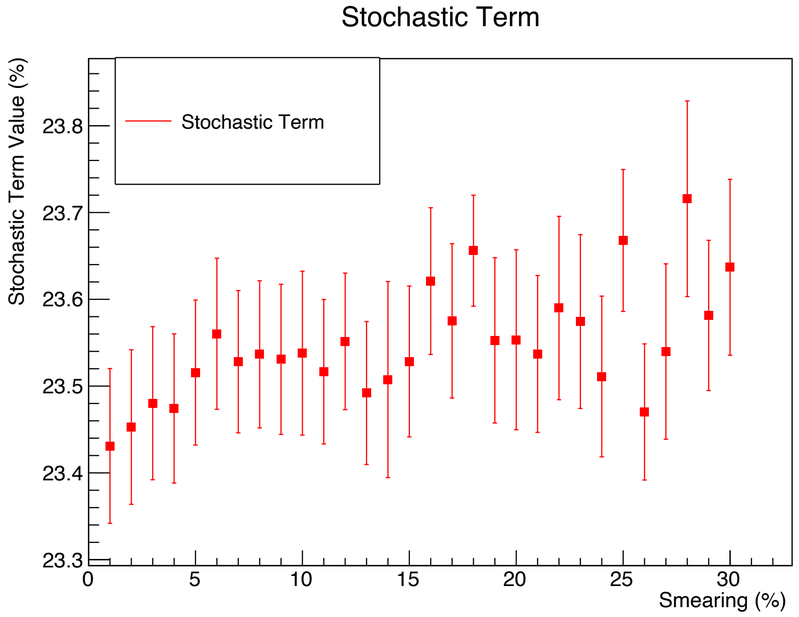



1.5 cm Sci

3 cm Fe

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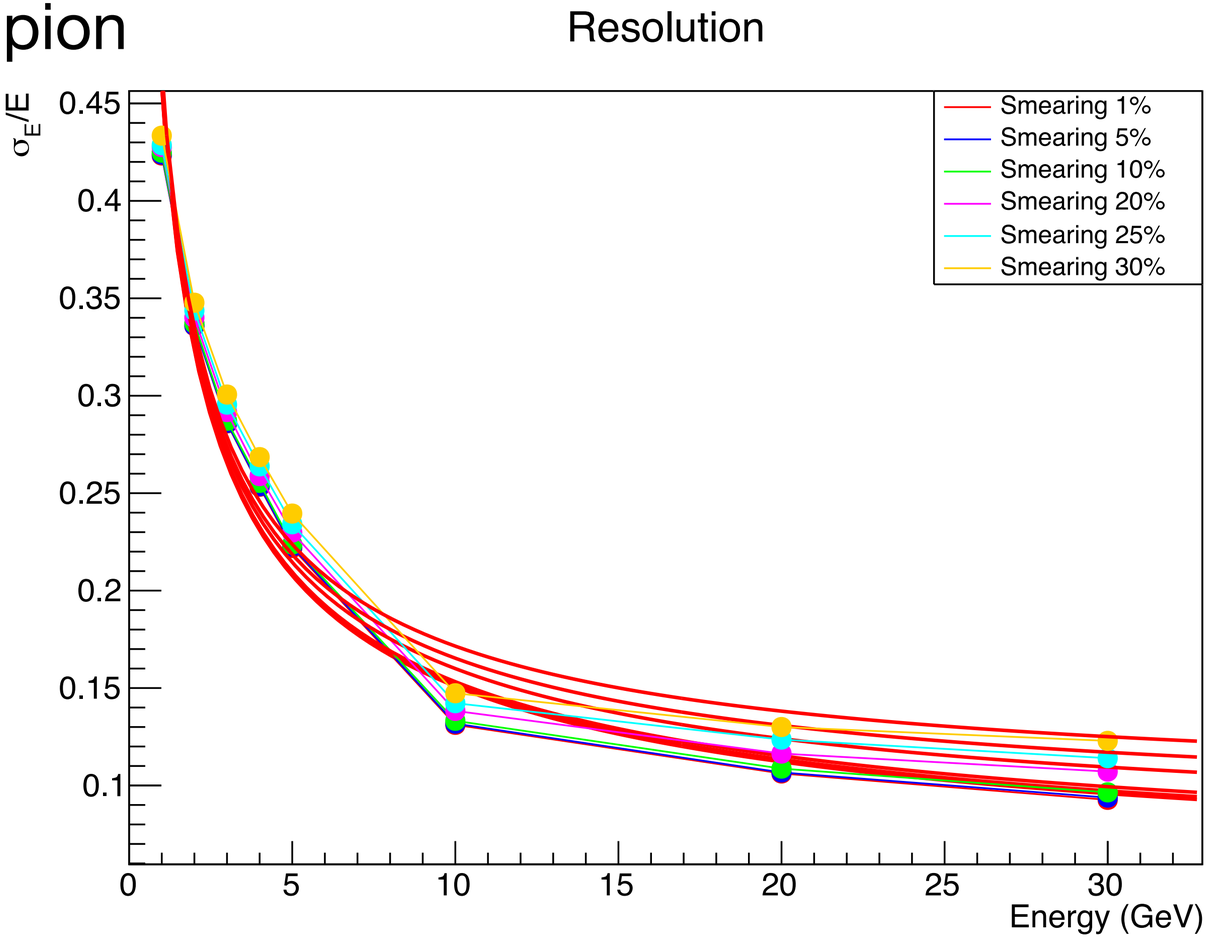
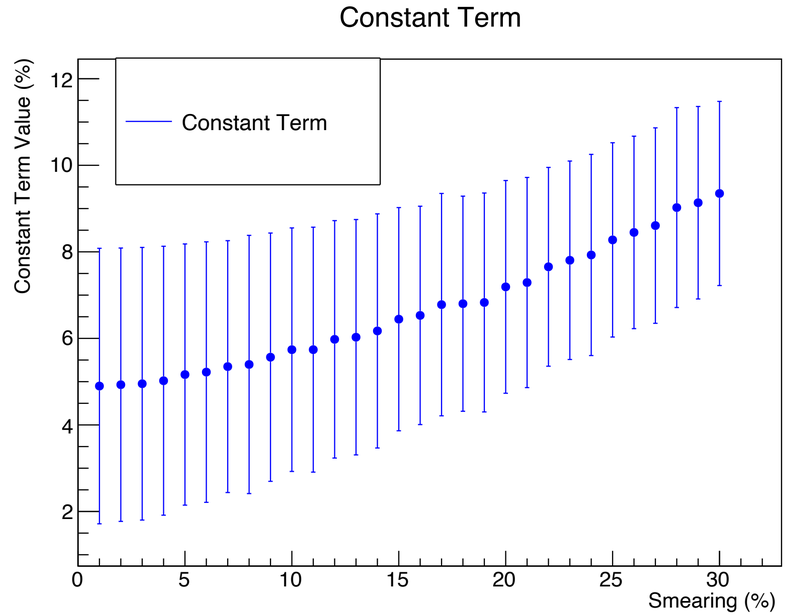
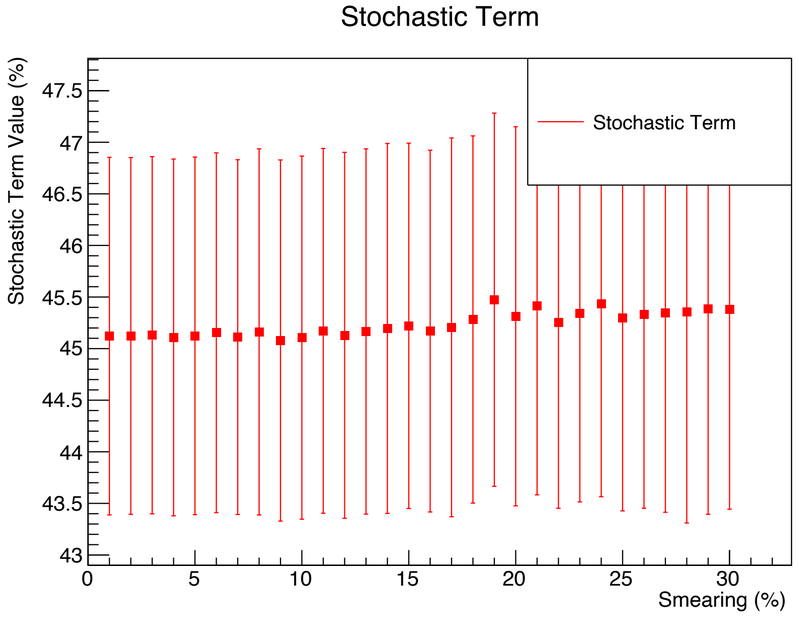



1.5 cm Sci

3 cm Fe

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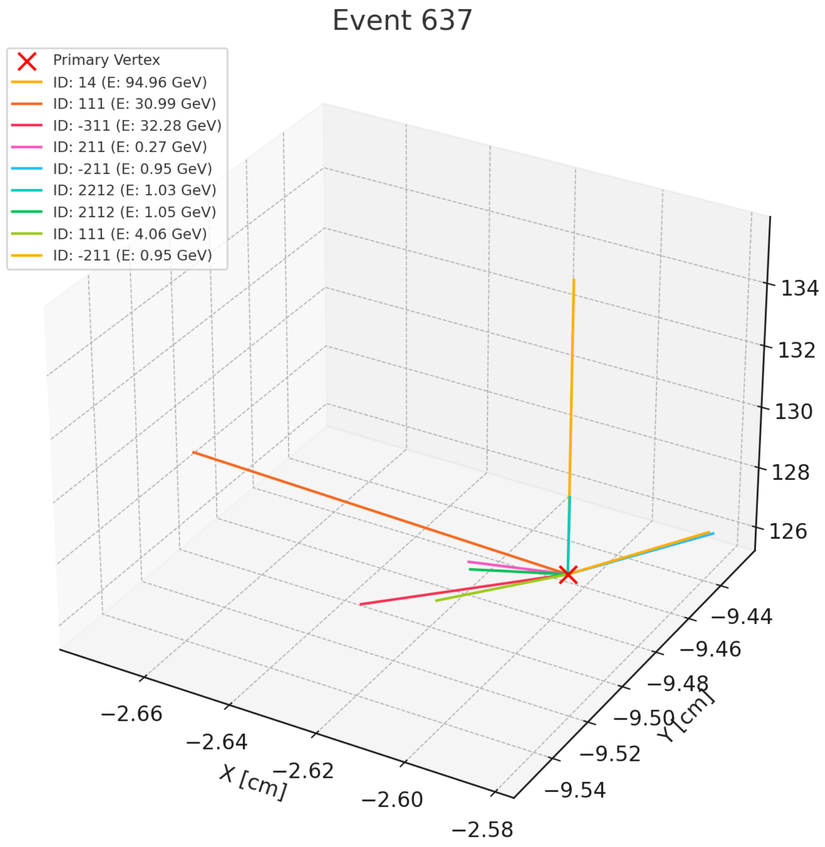
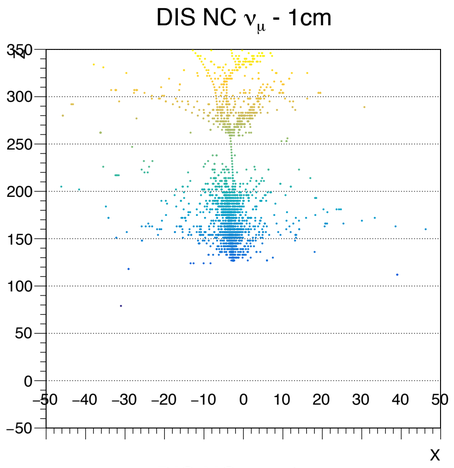
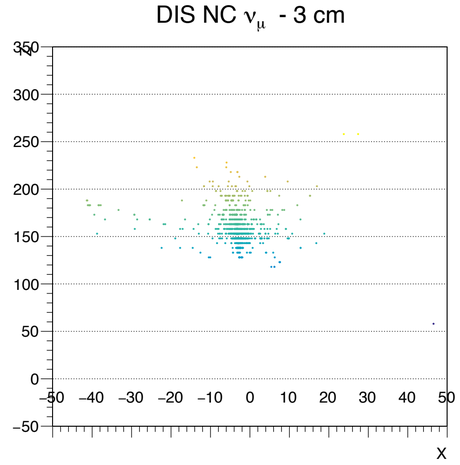
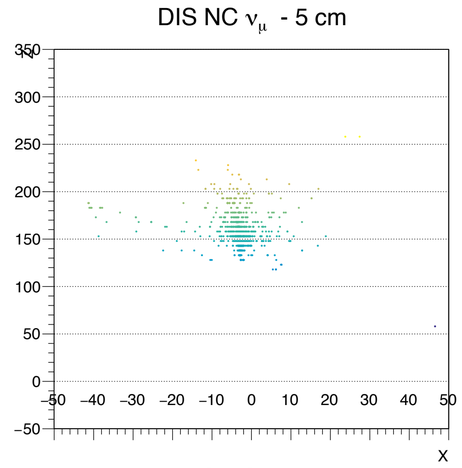
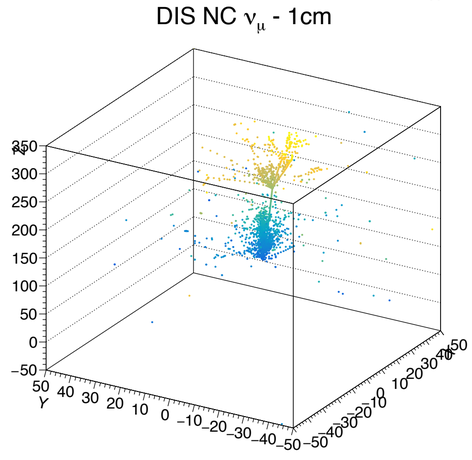
# Event display

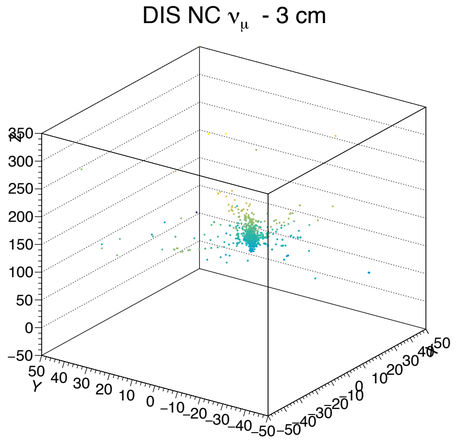


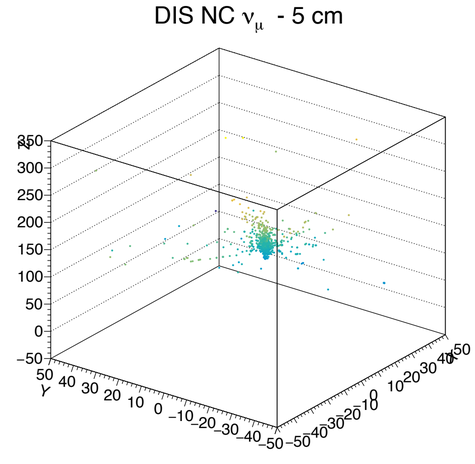




Each line represents the trajectory of a particle originating from the primary vertex.

The colours and labels indicate the particle IDs and their corresponding energies.

# Vertex resolution

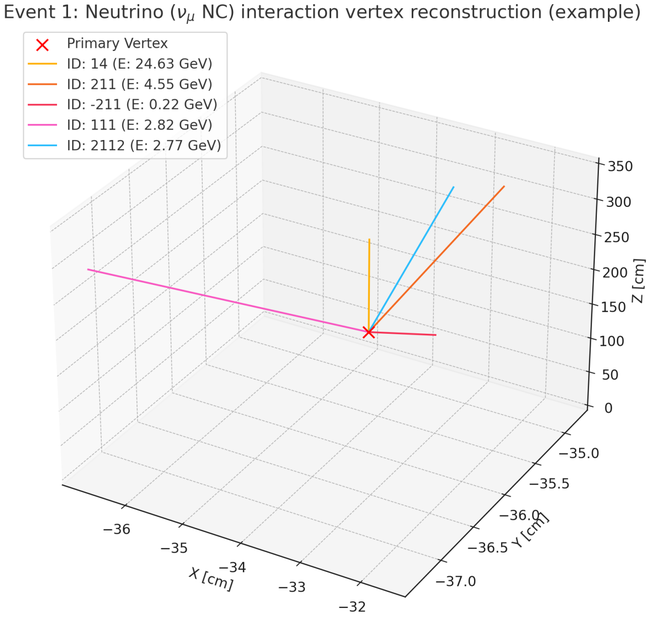
The interaction of a neutrino ($DISNC\nu_\mu$) with a target nucleus was simulated using GENIE framework.

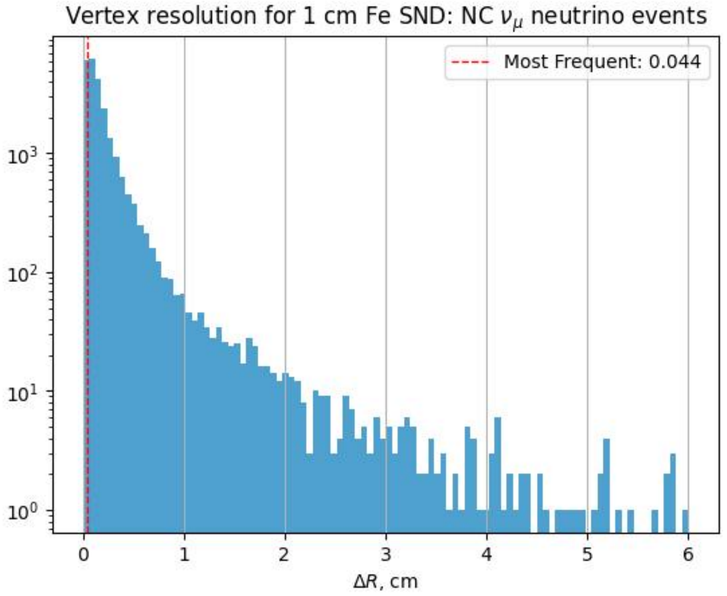
The GEANT4 toolkit was used to simulate the response of a realistic detector:

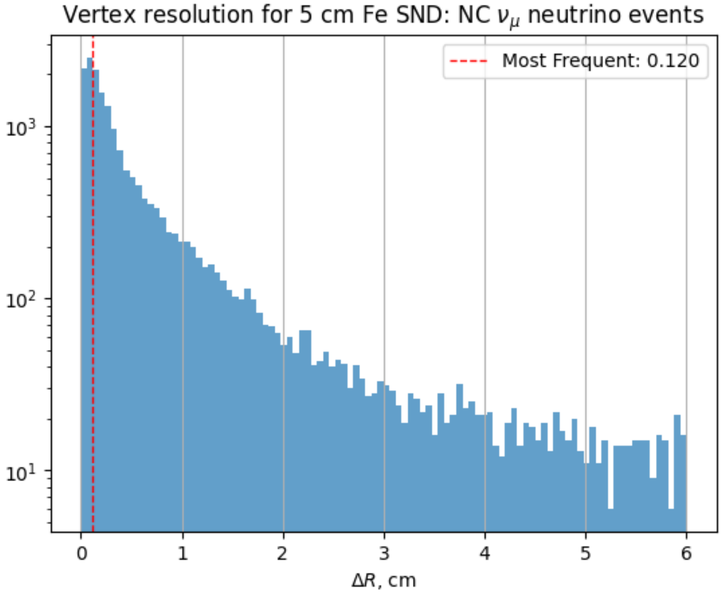
- Particle trajectories were tracked through detector layers.
- **Hits:** Positions where particles intersect sensitive detector layers (e.g., Sci-Fi layers).

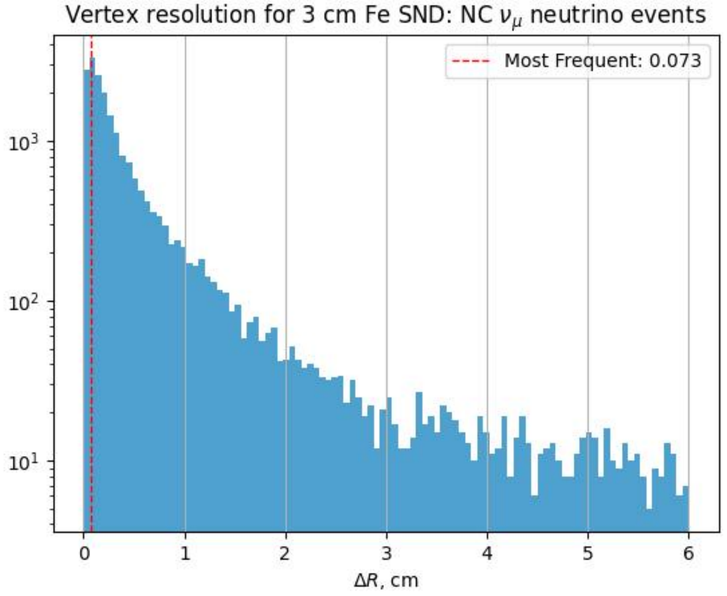
Each particle from the interaction was assigned a **Track ID** corresponding to its trajectory in the detector.

Tracks were extrapolated to their point of neutrino interaction.




**Next Steps:**

- **Track Reconstruction:**
  - Develop algorithms to associate hits in the detector with particle trajectories.
  - Refine fitting techniques for higher accuracy.
- **Vertex Resolution Analysis:**
  - Compare reconstructed vertices with simulated ones to quantify resolution.
  - Assess systematic uncertainties due to detector effects and event topology.