Energy Loss Model

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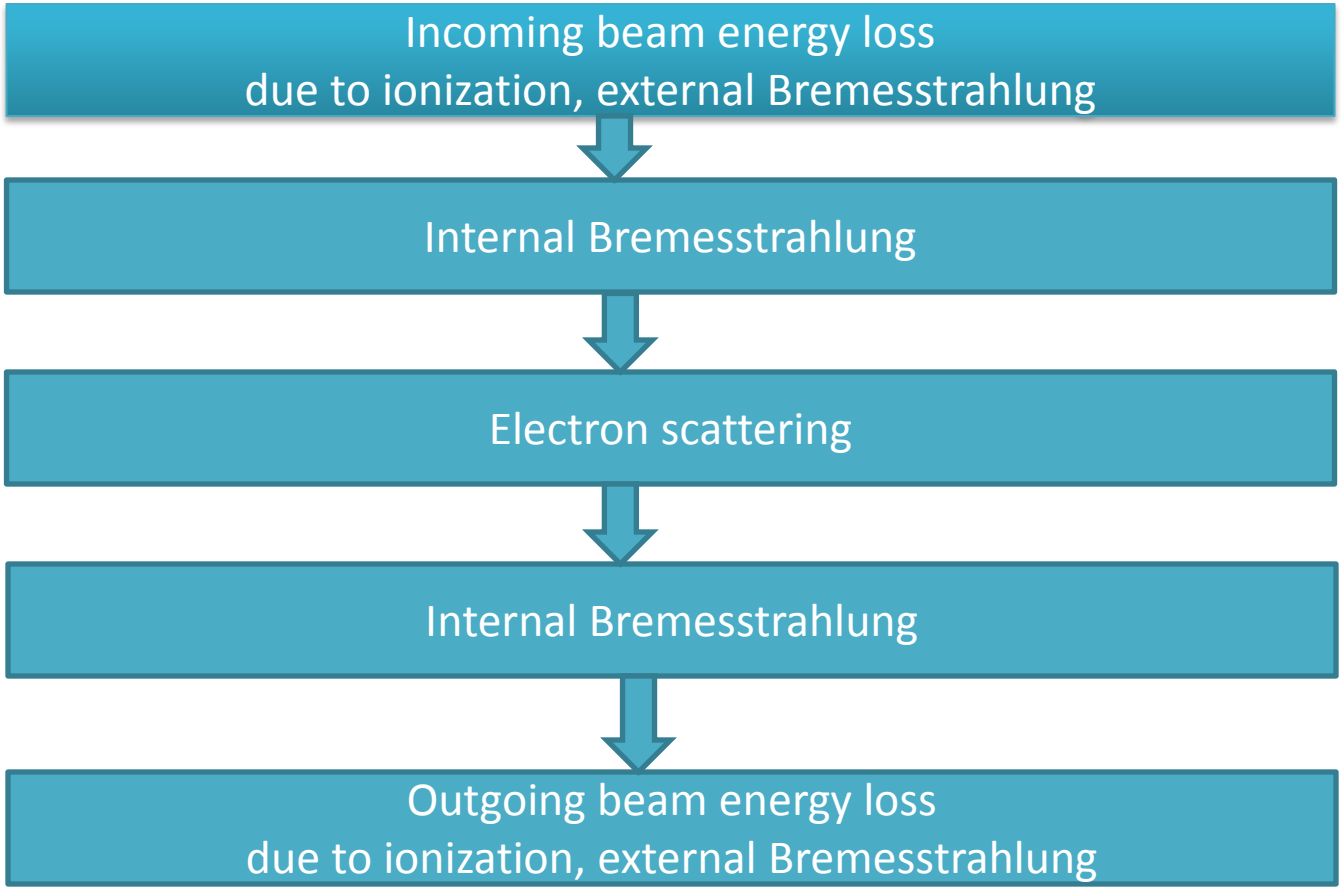
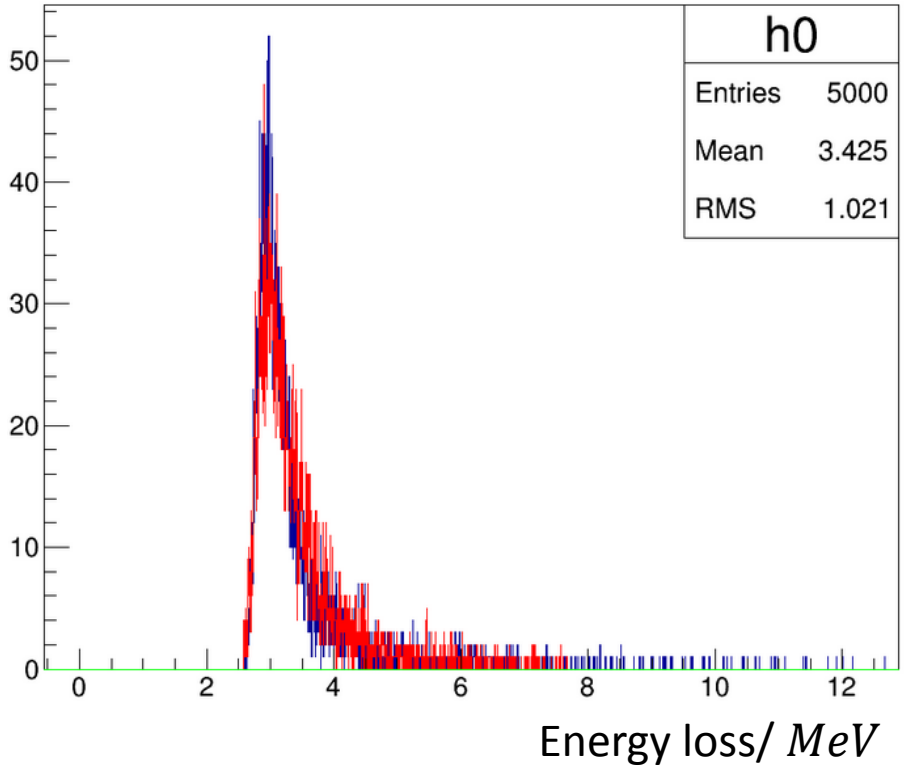
Last time Review

Energy loss step by step



Last time Review

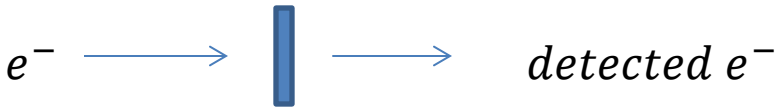
Ionization Model comparison



- ❑ Look at the energy loss distribution for electron pass through carbon at fixed length 1.016cm
  - ✓ Only ionization model
- ❑ Blue is from fluctuation model
- ❑ Red is from New Landau function Landau (x, ε)

Consistent!

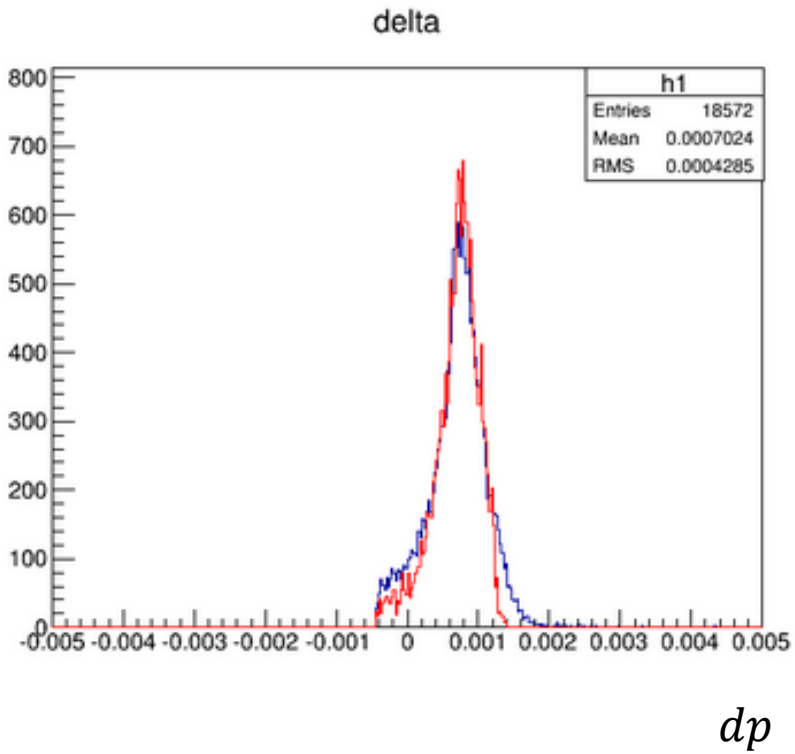
Fixed pass distance 1.016cm for each event



Only carbon layer, not g2p target

Last time Review

Model vs Data

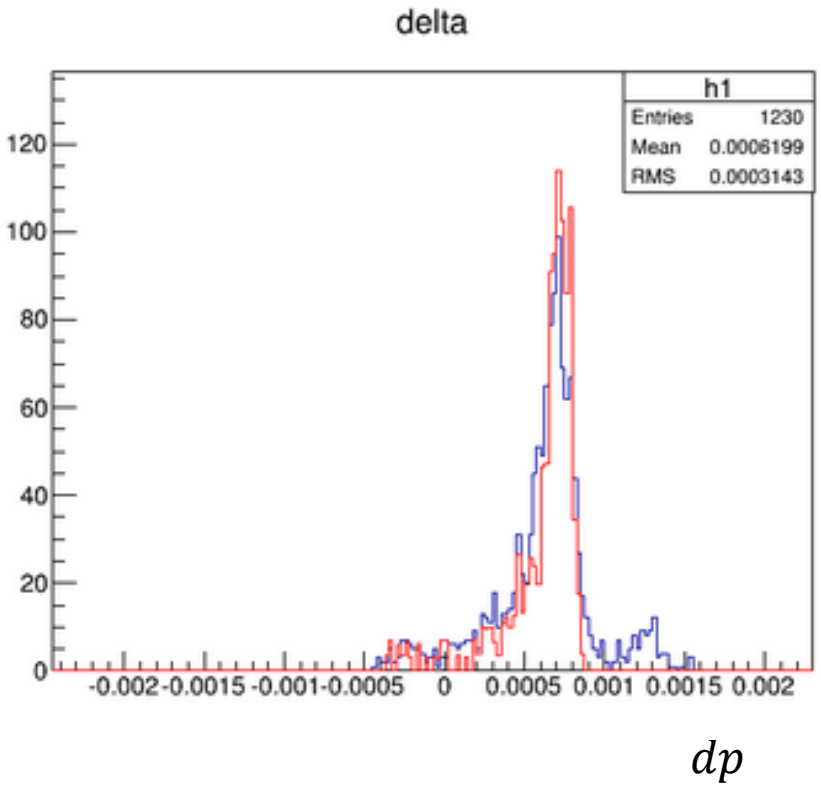


- Blue: from data, C w/o He optics
- Red: is from simulation:
  ioni fluctuation
  + internal+external brem.
- Total sieve holes

2.2 GeV, straight through Carbon without LHe run

Last time Review

Model vs Data

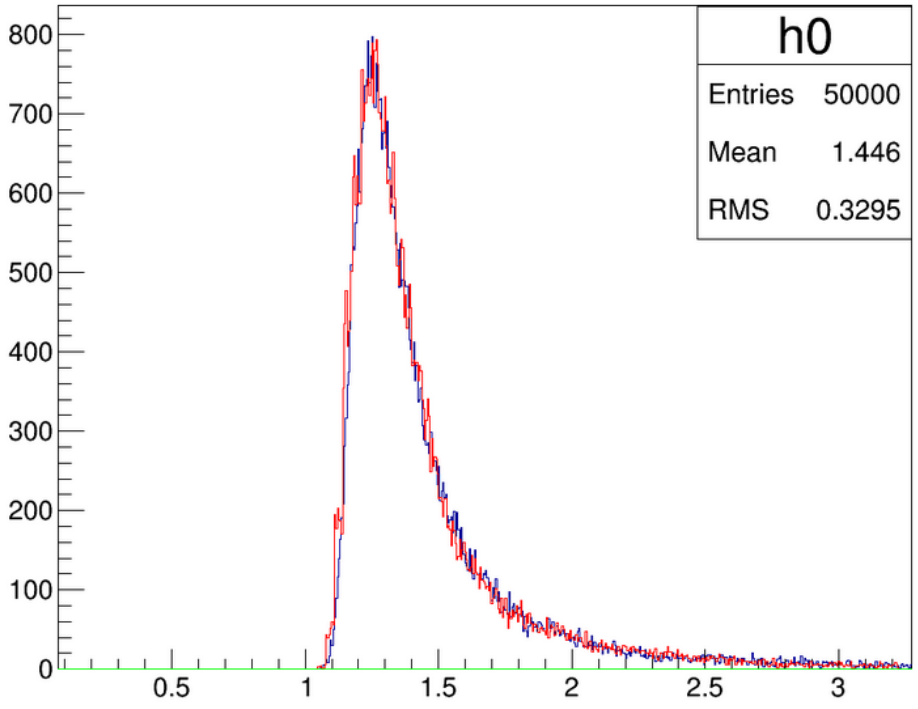


- Blue: from data, C w/o He optics
- Red: is from simulation:
  ioni fluctuation
  + internal+external brem.
- Center sieve holes

2.2 GeV, straight through Carbon without LHe run

- Check the two ionization models on different material
- Check data versus simulation (other targets)

Ionization Model comparison



Energy loss/ MeV

- ❑ Look at the energy loss distribution for electron pass through carbon at fixed length 1cm
  - ✓ Only ionization model
- ❑ Blue is from fluctuation model
- ❑ Red is from New Landau function Landau (x, ε)

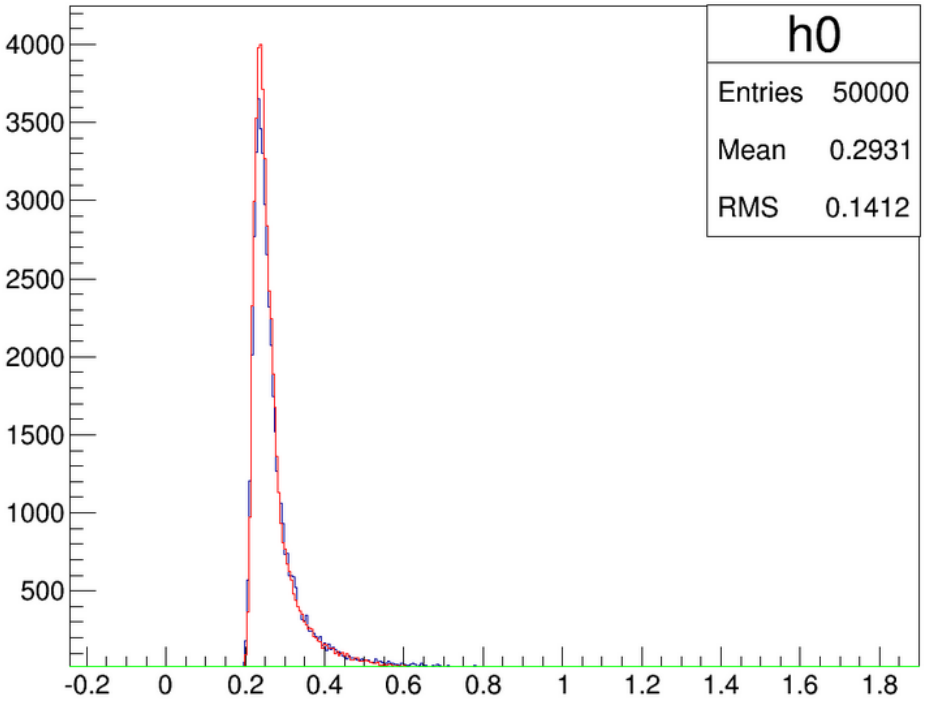
Consistent!

Fixed pass distance 1cm for each event

e^- → | → $detected\ e^-$

Only NH3 layer, not g2p target

Ionization Model comparison



Energy loss/ MeV

- ❑ Look at the energy loss distribution for electron pass through carbon at fixed length 1cm
  - ✓ Only ionization model
- ❑ Blue is from fluctuation model
- ❑ Red is from New Landau function Landau (x, ε)

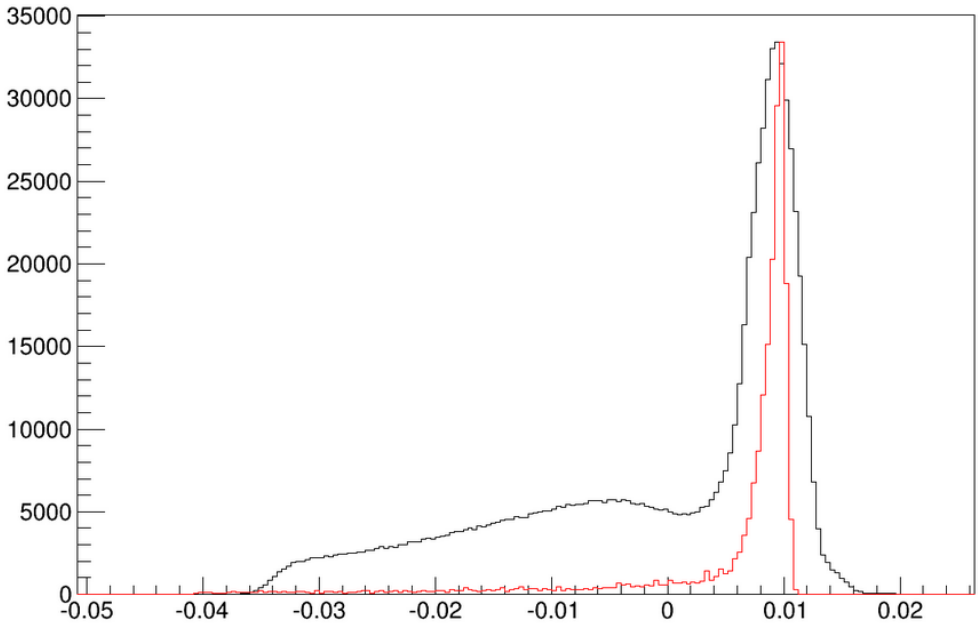
Fixed pass distance 1cm for each event

e^- → | → $detected\ e^-$

Only LHe layer, not g2p target

→ **Consistent!**

Model vs Data

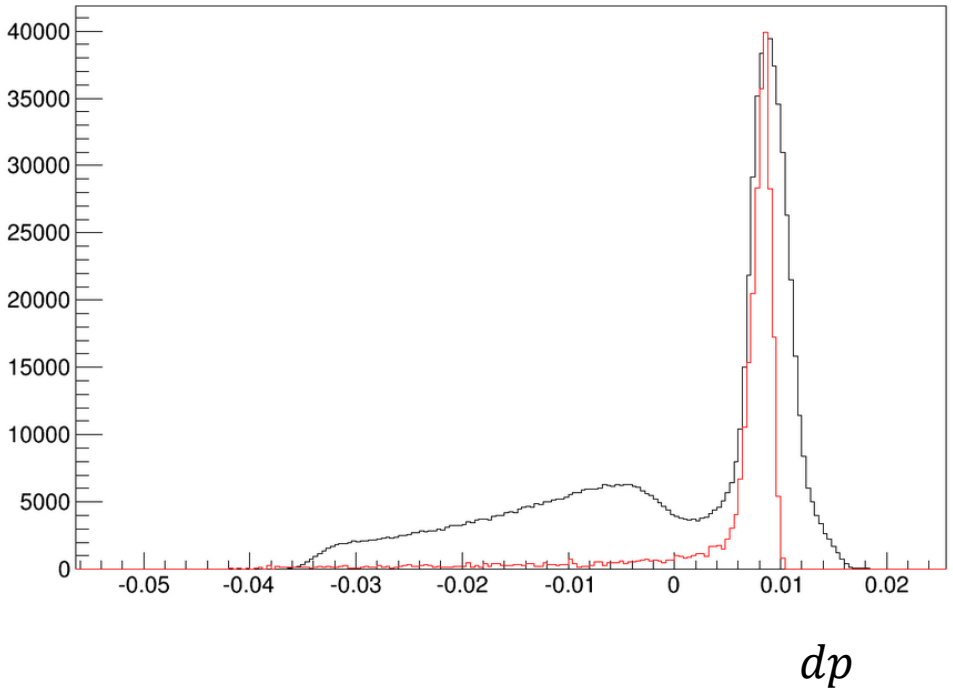


- Total energy loss simulation compared with data
- Blue: from data
- Red: is from simulation:
  ioni fluctuation
  + internal+external brem.

Simulation width narrower

2.2 GeV, 5T carbon Run 5649

Model vs Data

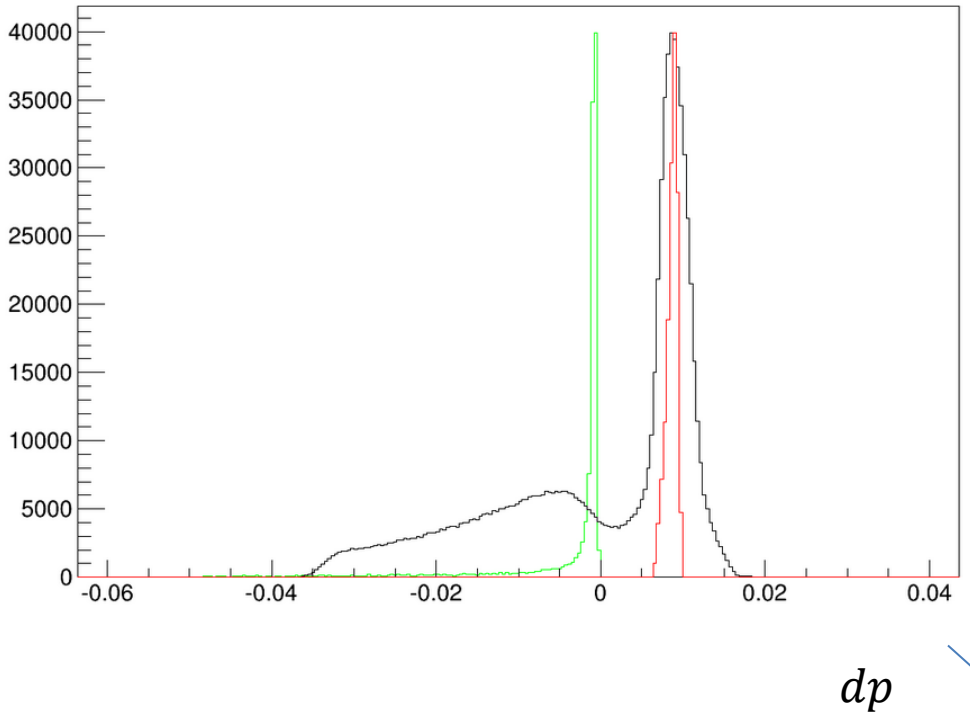


- Total energy loss simulation compared with data
- Blue: from data
- Red: is from simulation:
  ioni fluctuation
  + internal+external brem.

Simulation width narrower

2.2 GeV, 5T empty Run 5650

Model vs Data



- Total energy loss simulation compared with data
- Blue: from data
- Green: energy loss due to ionization and bremesstrahlung
- Red: dp distribution due to elastic scattering
- Other cause the width larger?

2.2 GeV, 5T empty Run 5650

Simulation width smaller

Todo

- Simulation width too small?
- Any suggestions?