Status Report | Andrea Delgado
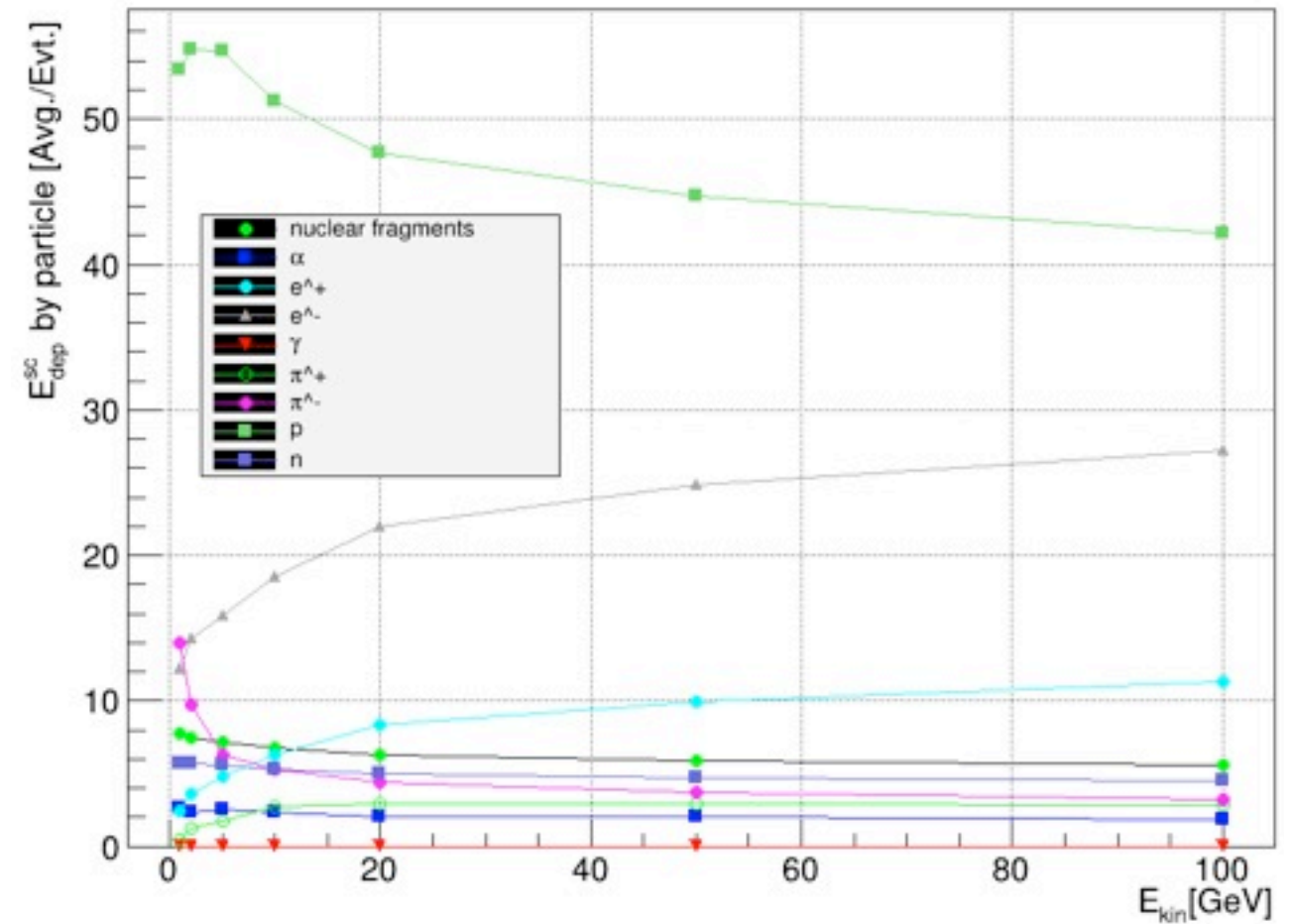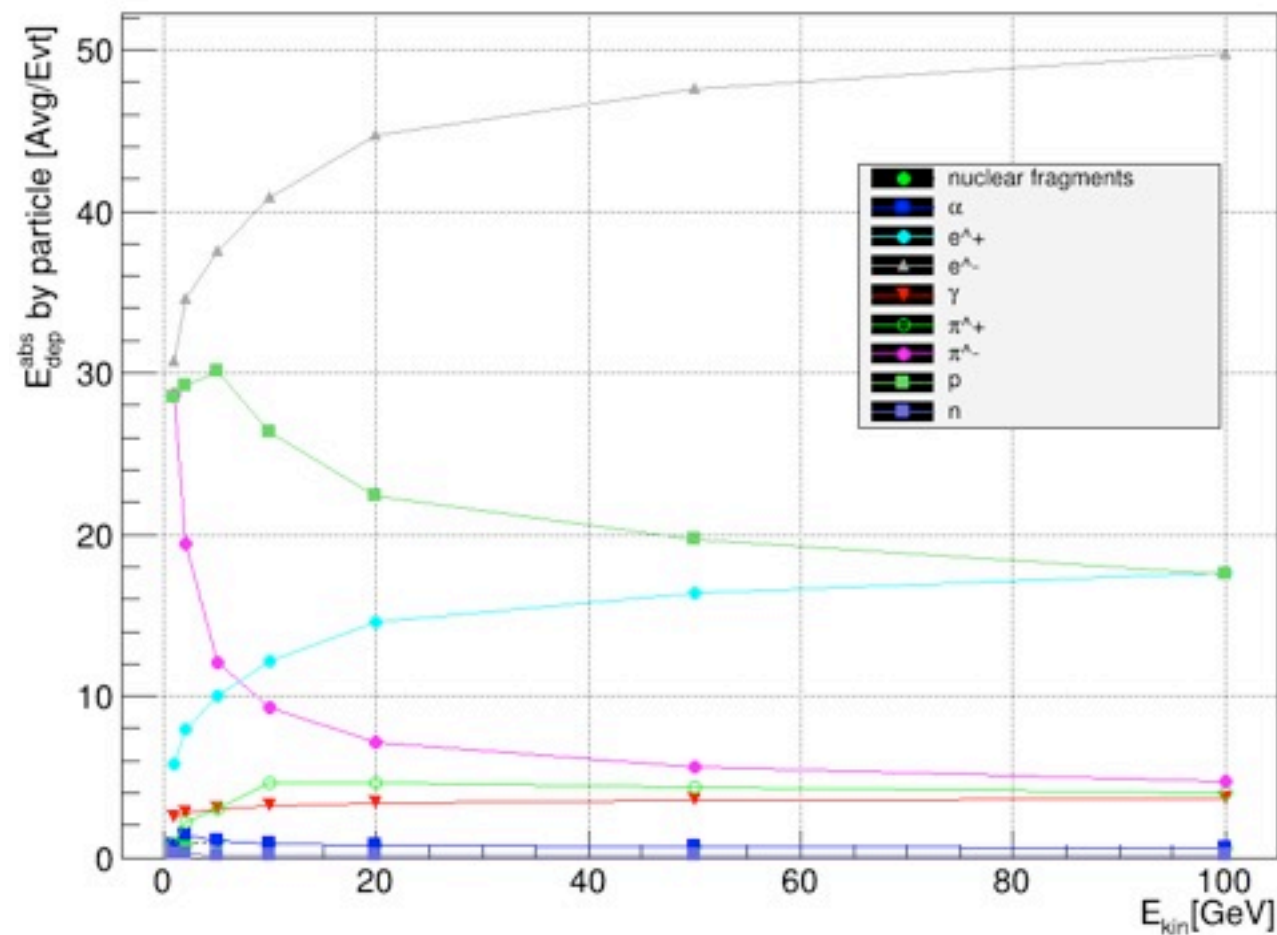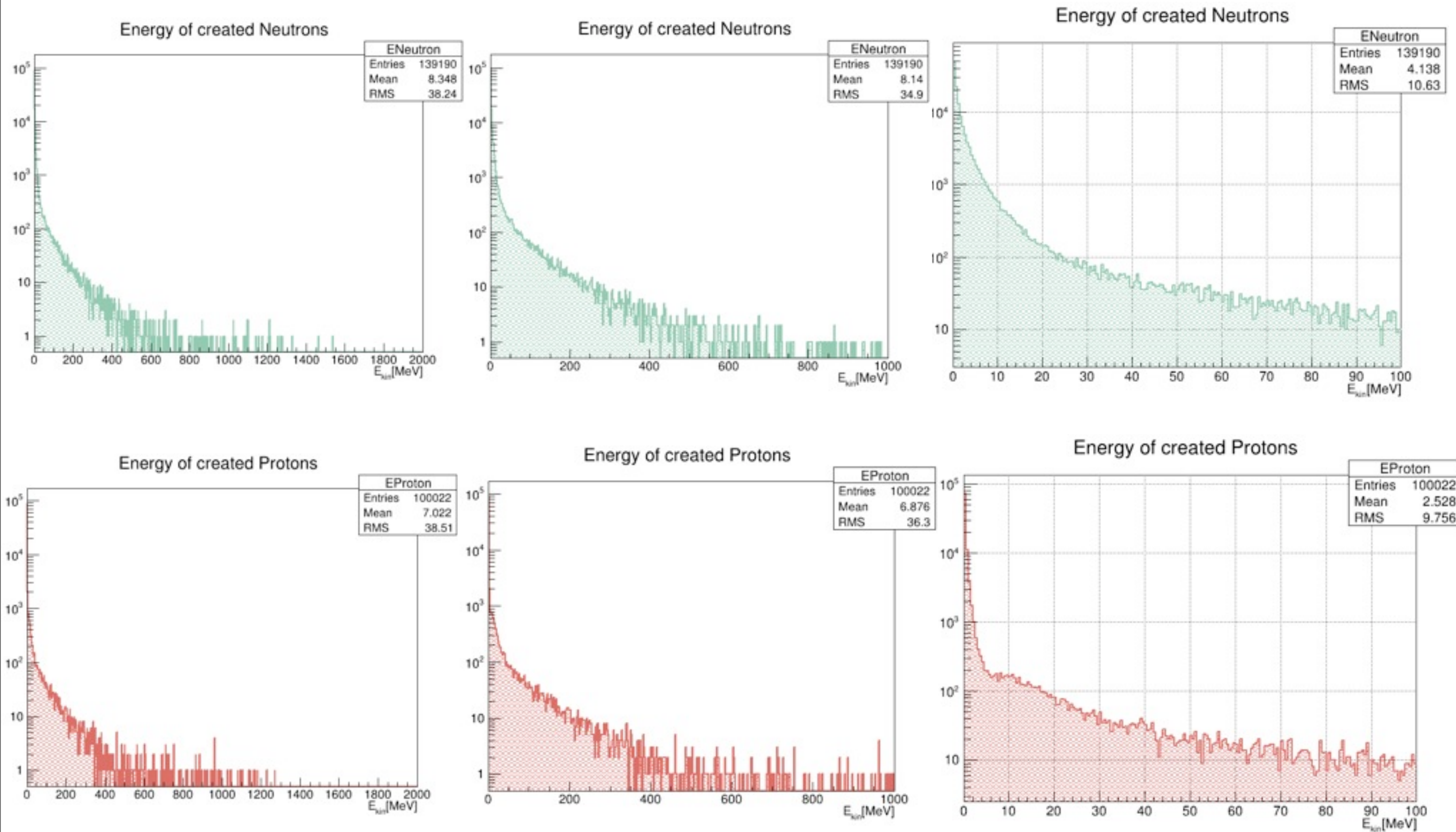
Status Report

- Implementation of Birks suppression

- e/h ratio

- Proton, neutron spectra

- Energy deposition by time

Contribution to energy resolution from protons

▸ Geant 4.9.6.p02
▸ Physics list: FTFP_BERT
▸ gdml: tiledsamplingcal4mmpb1mmSz

Spectra of created particles (Entire calorimeter volume)

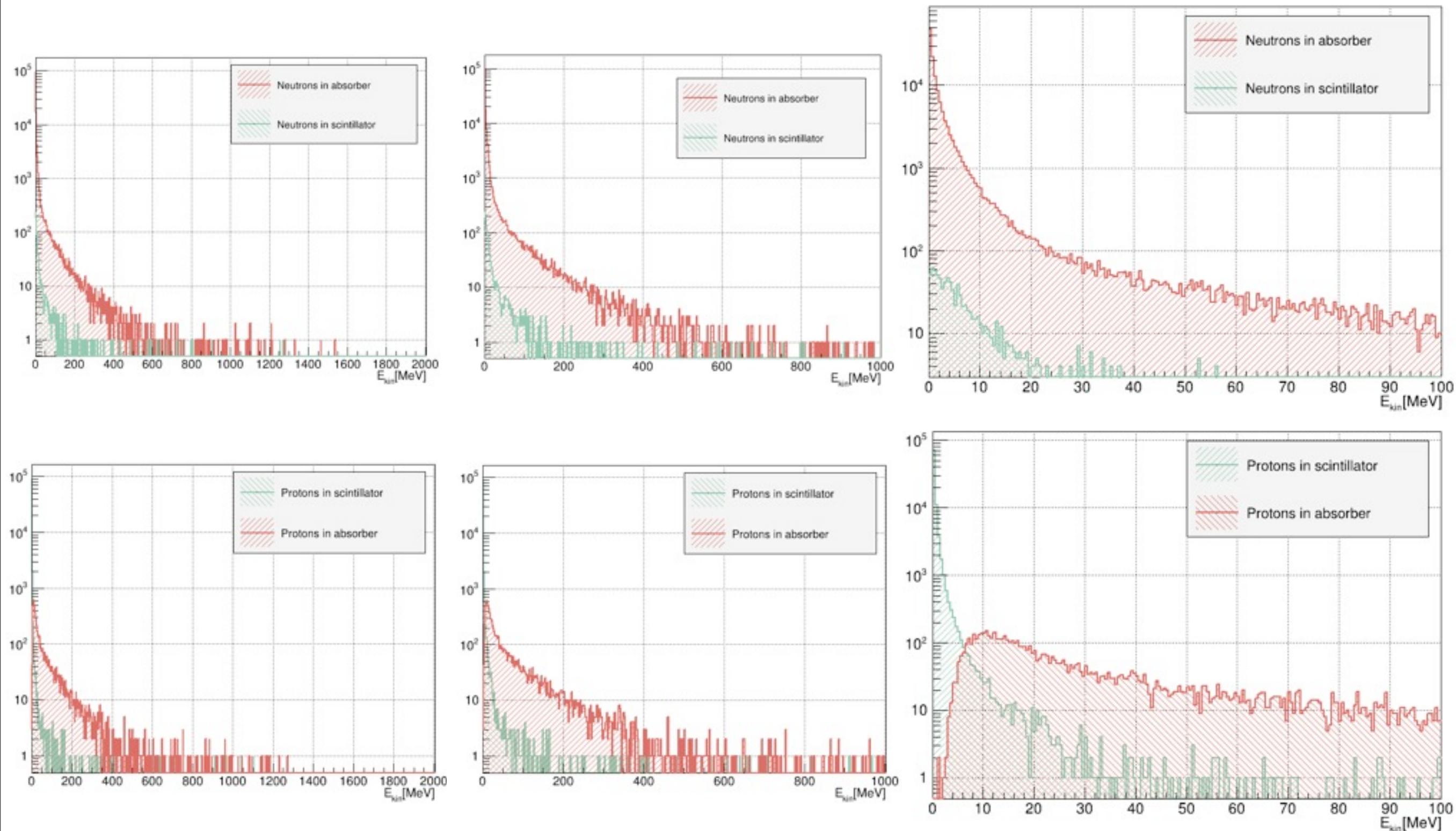- ▸ Geant 4.9.6.p02
- ▸ Physics list: FTFP_BERT
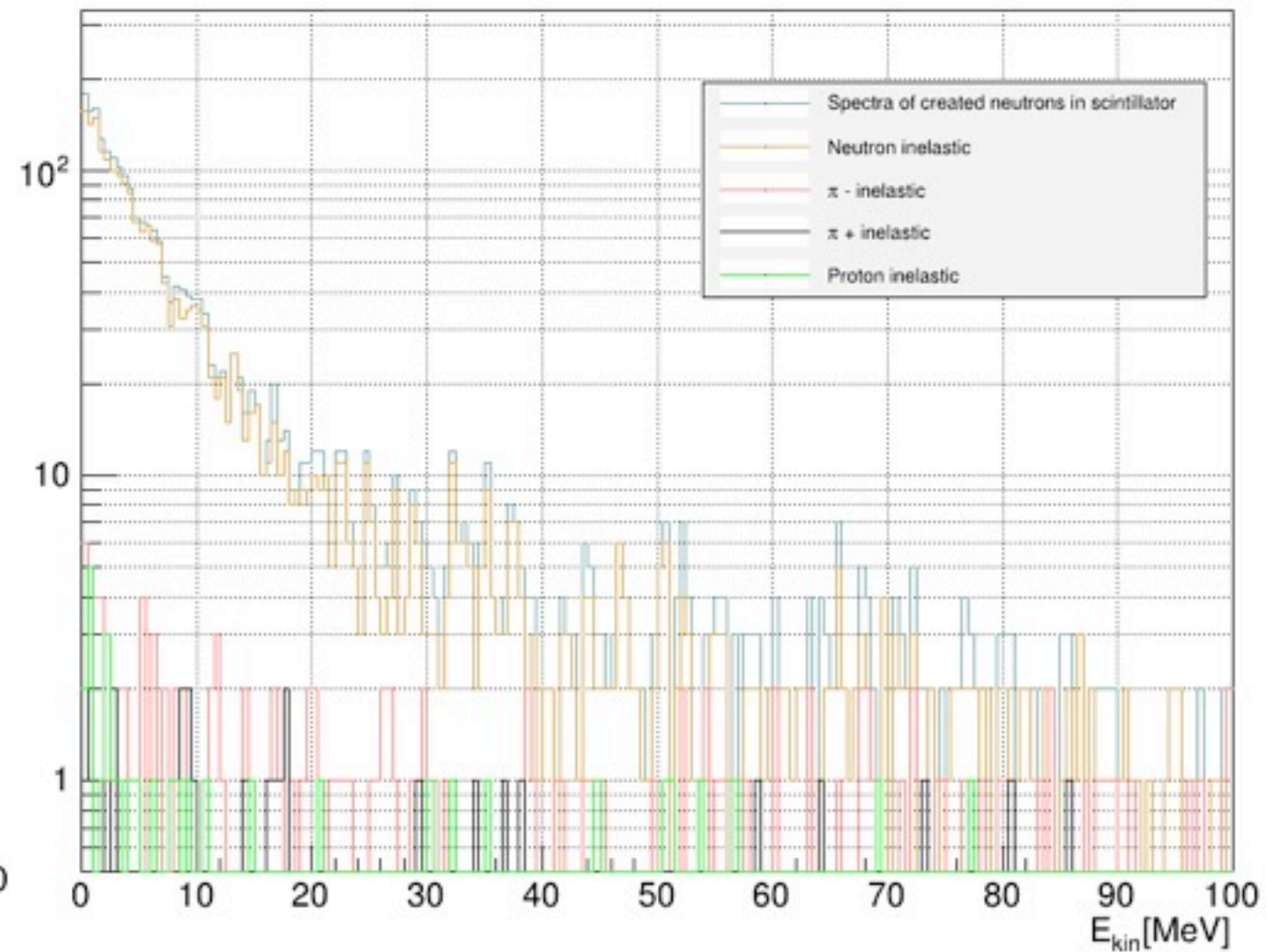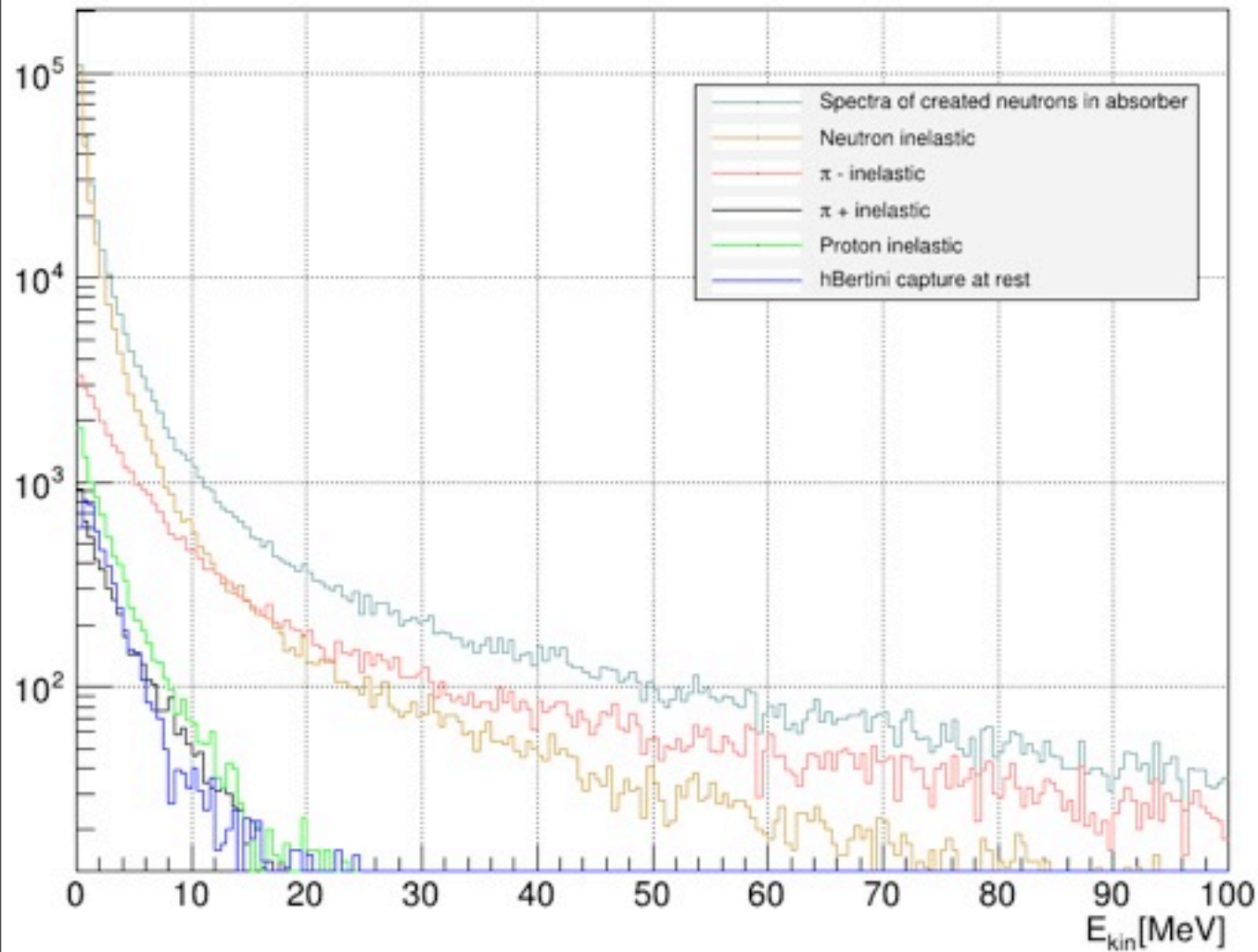- ▸ gdml: tiledsamplingcal4mmpb1mmSz

- ▸ 2.0 GeV pi-
- ▸ 1000 events

Spectra of created particles (scint or Pb volume)

▸ Geant 4.9.6.p02
▸ Physics list: FTFP_BERT
▸ gdml: tiledsamplingcal4mmpb1mmSz

▸ 2.0 GeV pi-
▸ 1000 events

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Spectra of created neutrons by process (scint or Pb volume)

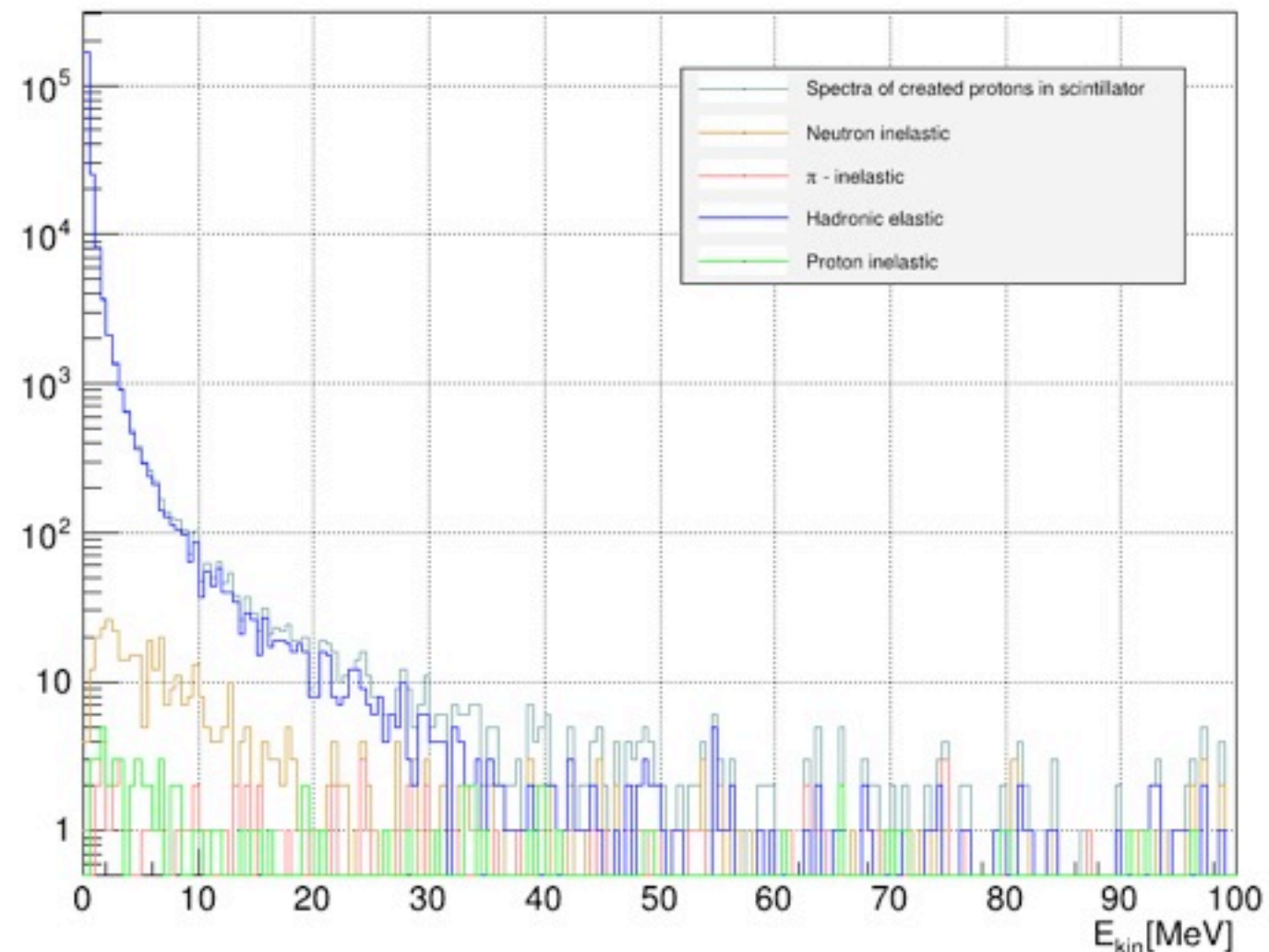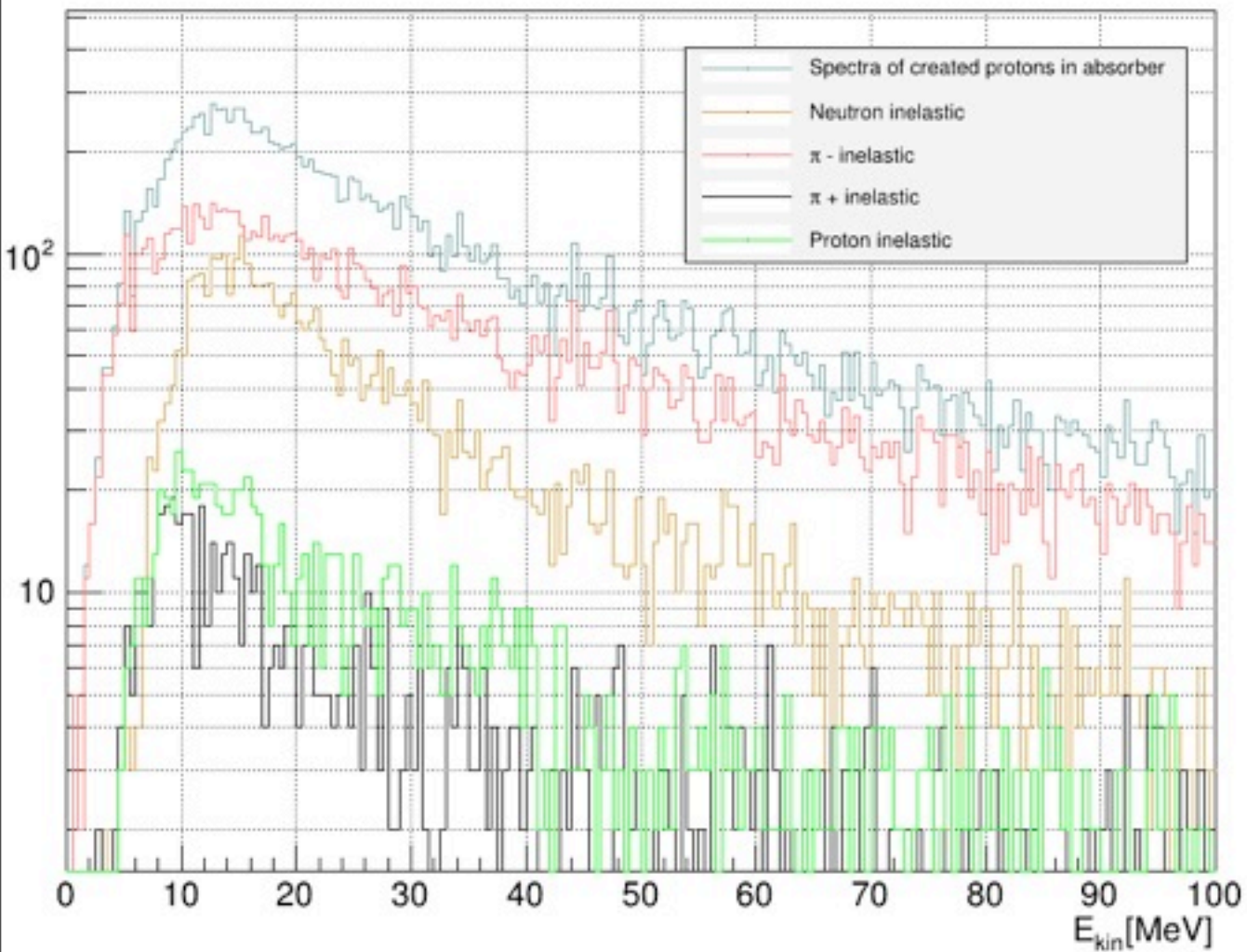
- Geant 4.9.6.p02
- Physics list: FTFP_BERT
- gdml: tiledsamplingcal4mmpb1mmSz
- 5.0 GeV pi-
- 1000 events

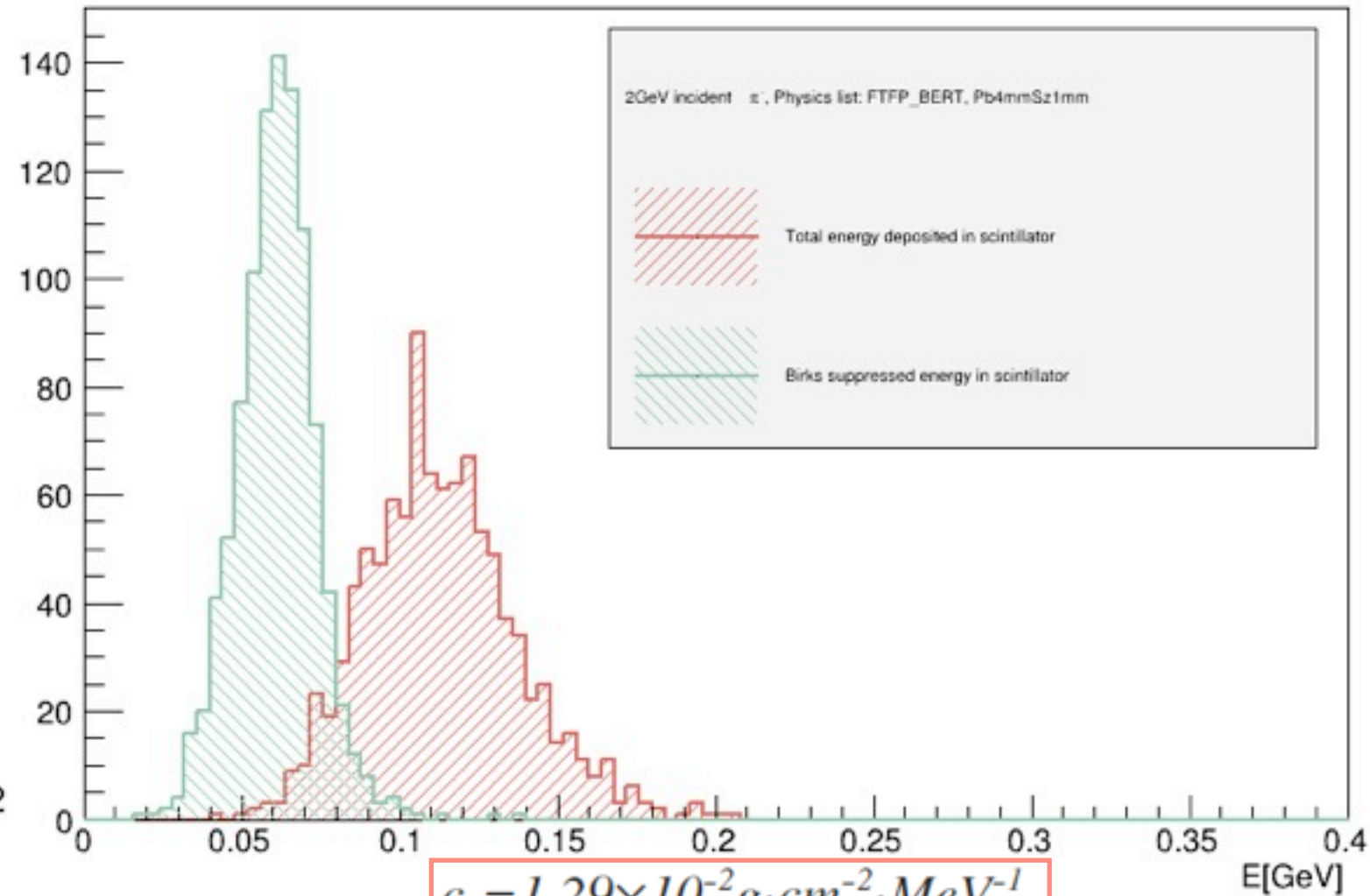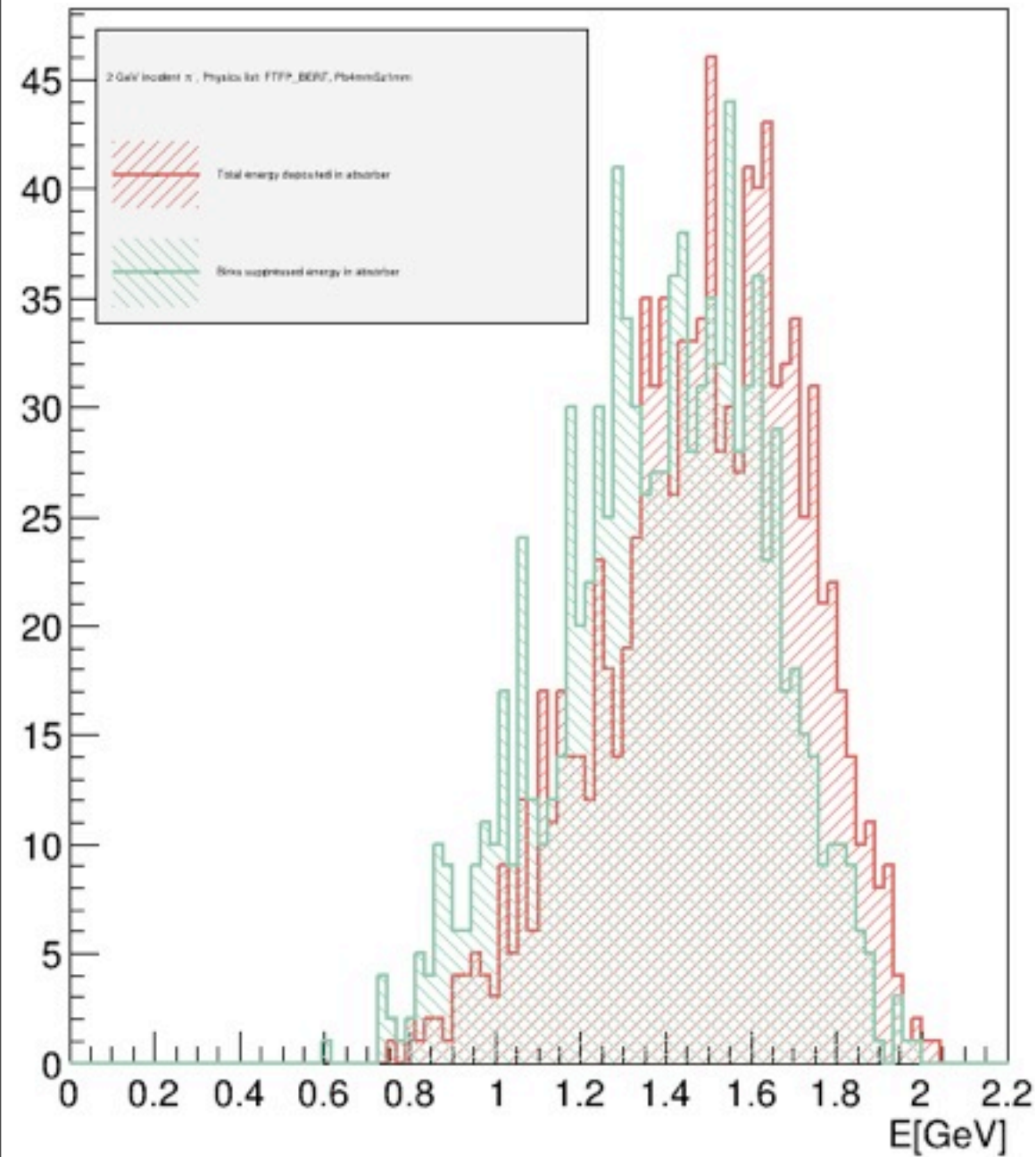# Spectra of created protons by process (scint or Pb volume)

- ▸ Geant 4.9.6.p02
- ▸ Physics list: FTFP_BERT
- ▸ gdml: tiledsamplingcal4mmpb1mmSz

- ▸ 5.0 GeV pi-
- ▸ 1000 events

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Birks suppression

$$\frac{dL}{dr} = \frac{S \cdot dE/dr}{1 + c_1 \cdot dE/dr + c_2 \cdot (dE/dr)^2}$$

$c_1 = 1.29 \times 10^{-2} g \cdot cm^{-2} \cdot MeV^{-1}$
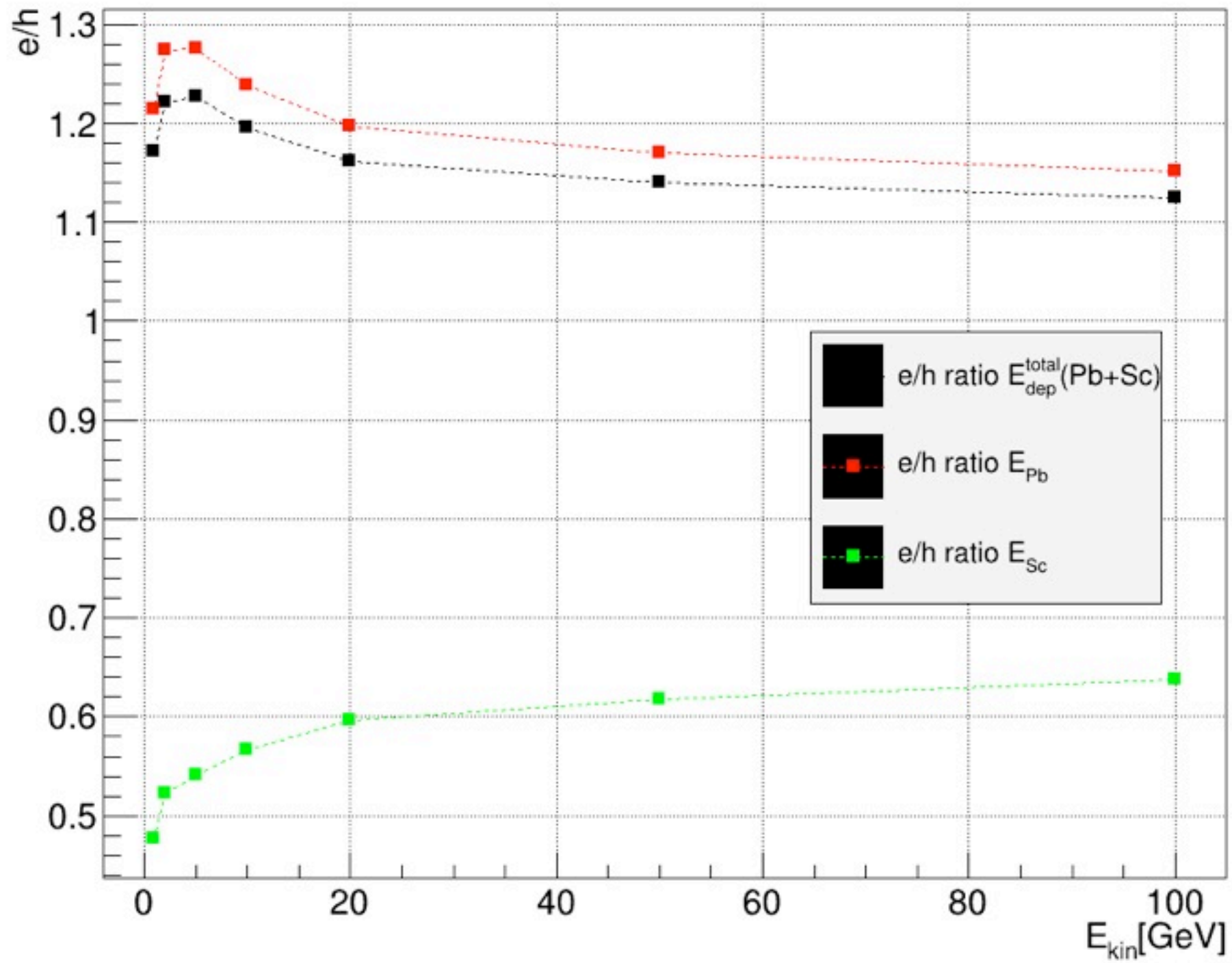
$c_2 = 9.59 \times 10^{-6} g^2 \cdot cm^{-4} \cdot MeV^{-2}$

$S = 1$

- Geant 4.9.6.p02
- Physics list: FTFP_BERT
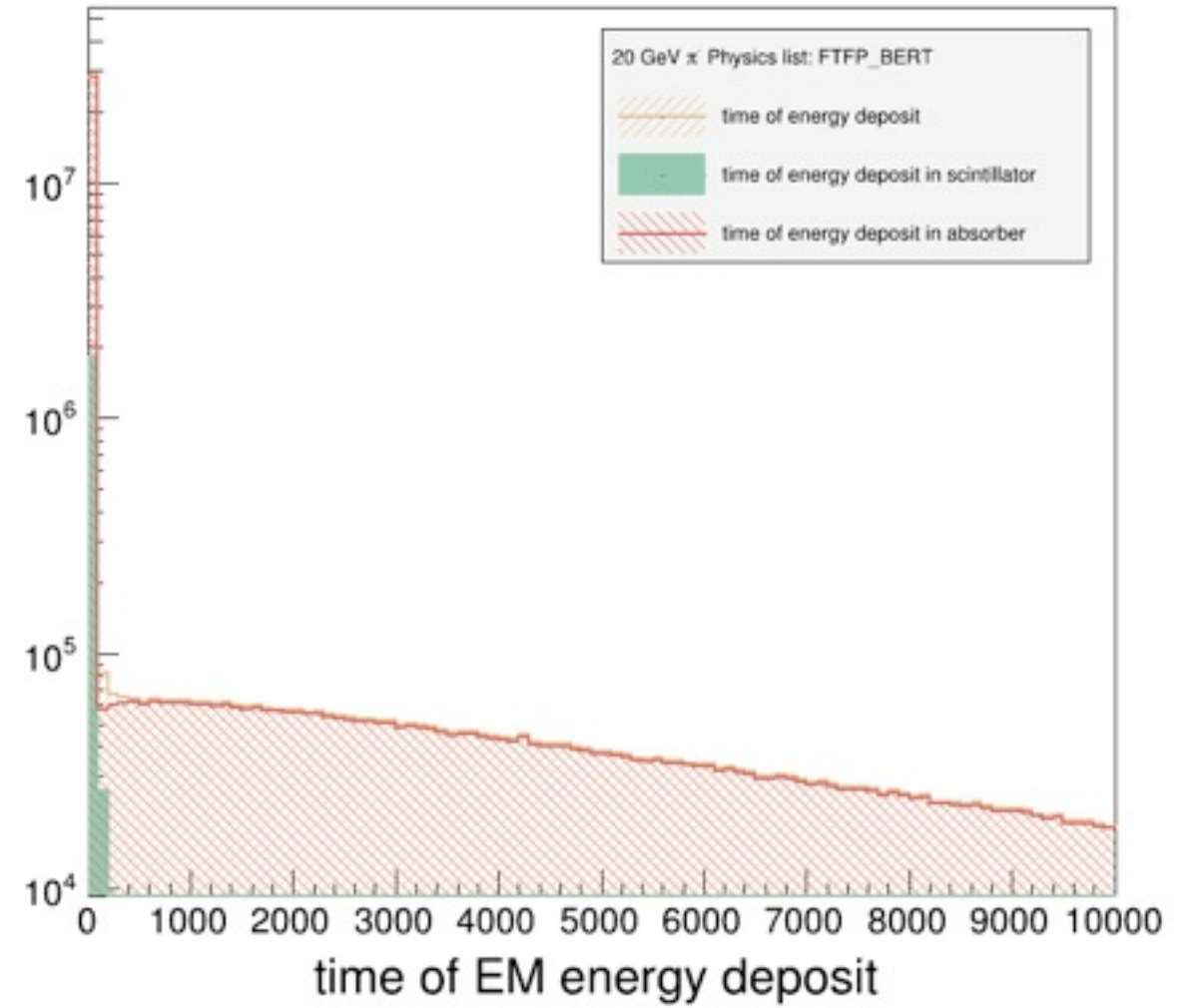- gdml: tiledsamplingcal4mmpb1mmSz

- 2.0 GeV pi-
- 1000 events

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e/h ratio

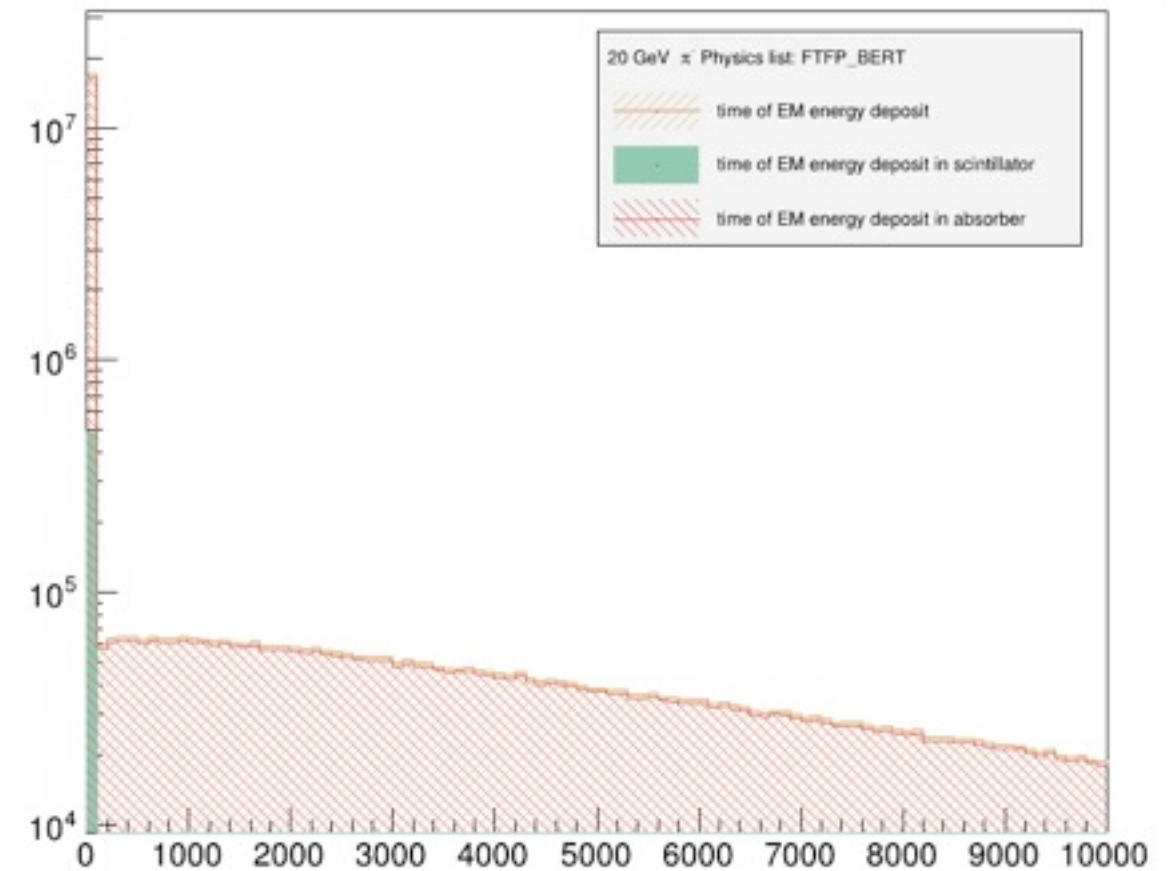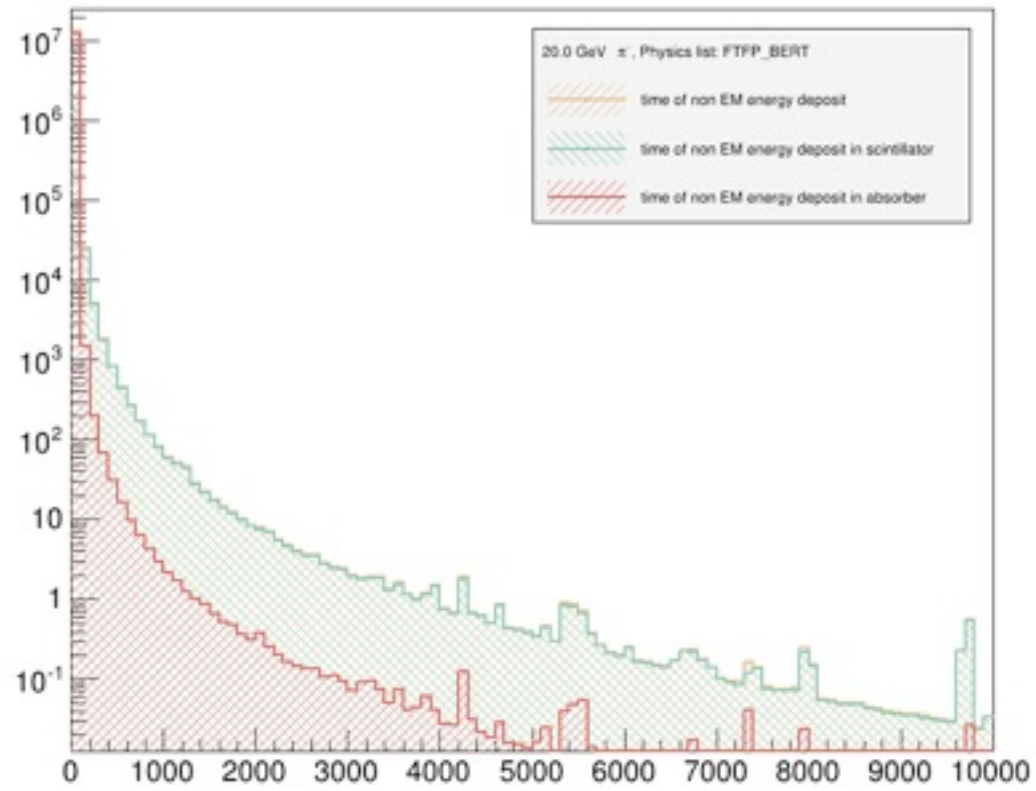- ▶ Geant 4.9.6.p02
- ▶ Physics list: FTFP_BERT
- ▶ gdml: tiledsamplingcal4mmpb1mmSz

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time of non EM energy deposit

time of energy deposit

time of EM energy deposit
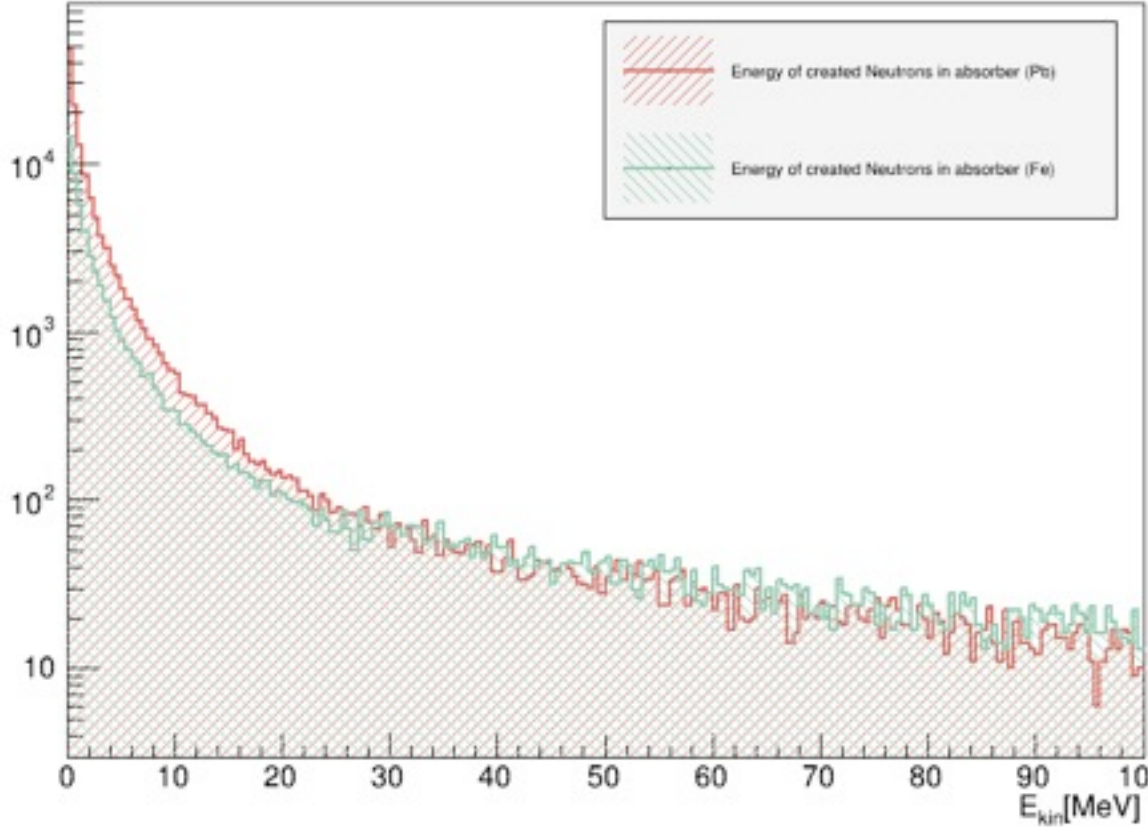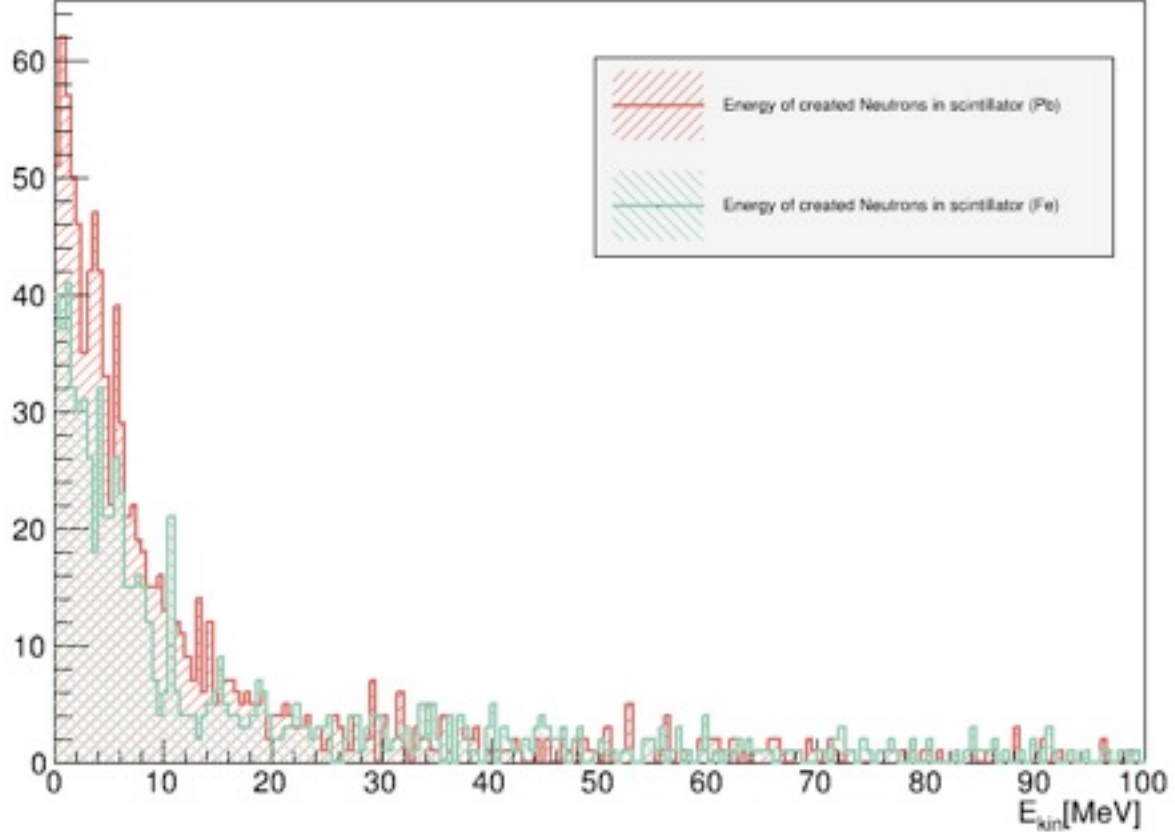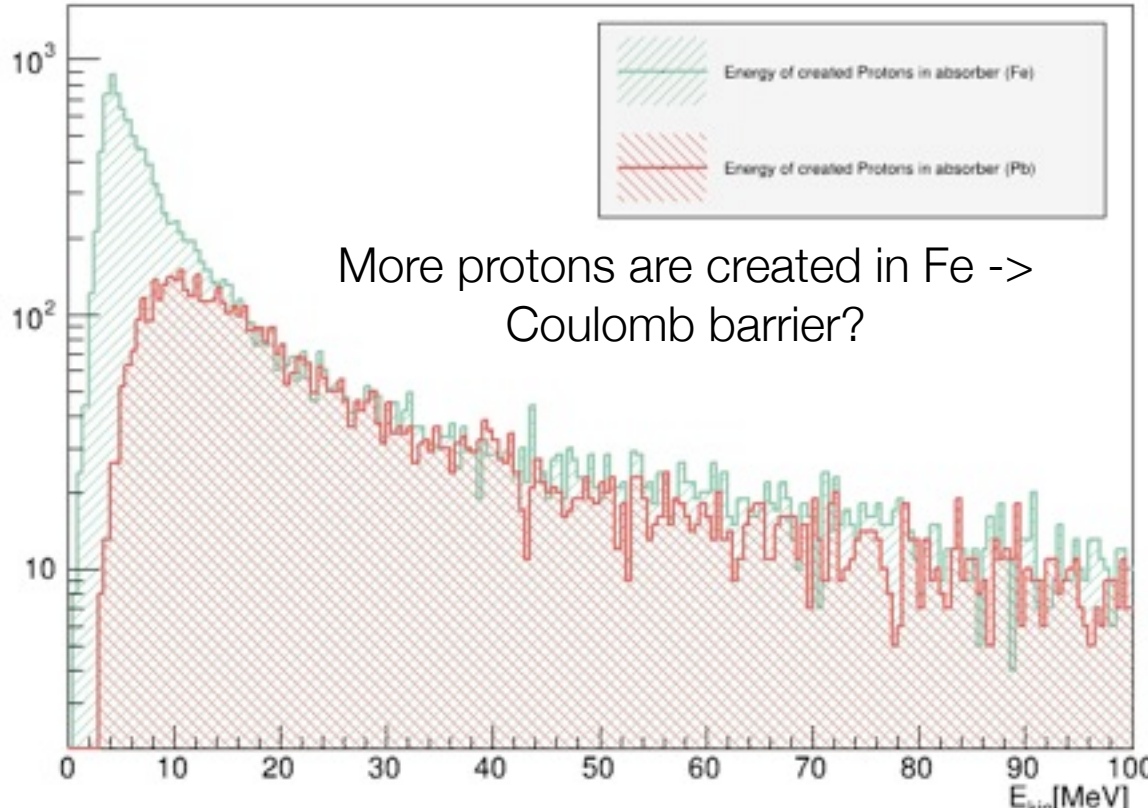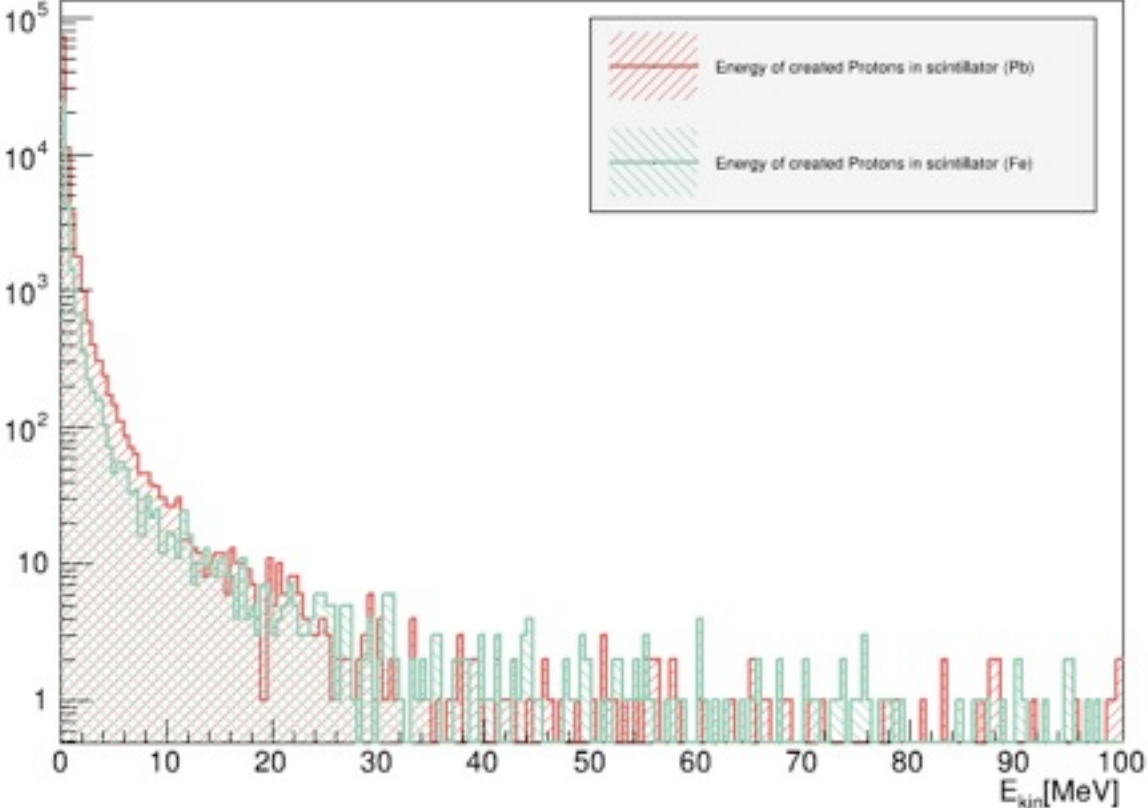
- ▸ Geant 4.9.6.p02
- ▸ Physics list: FTFP_BERT
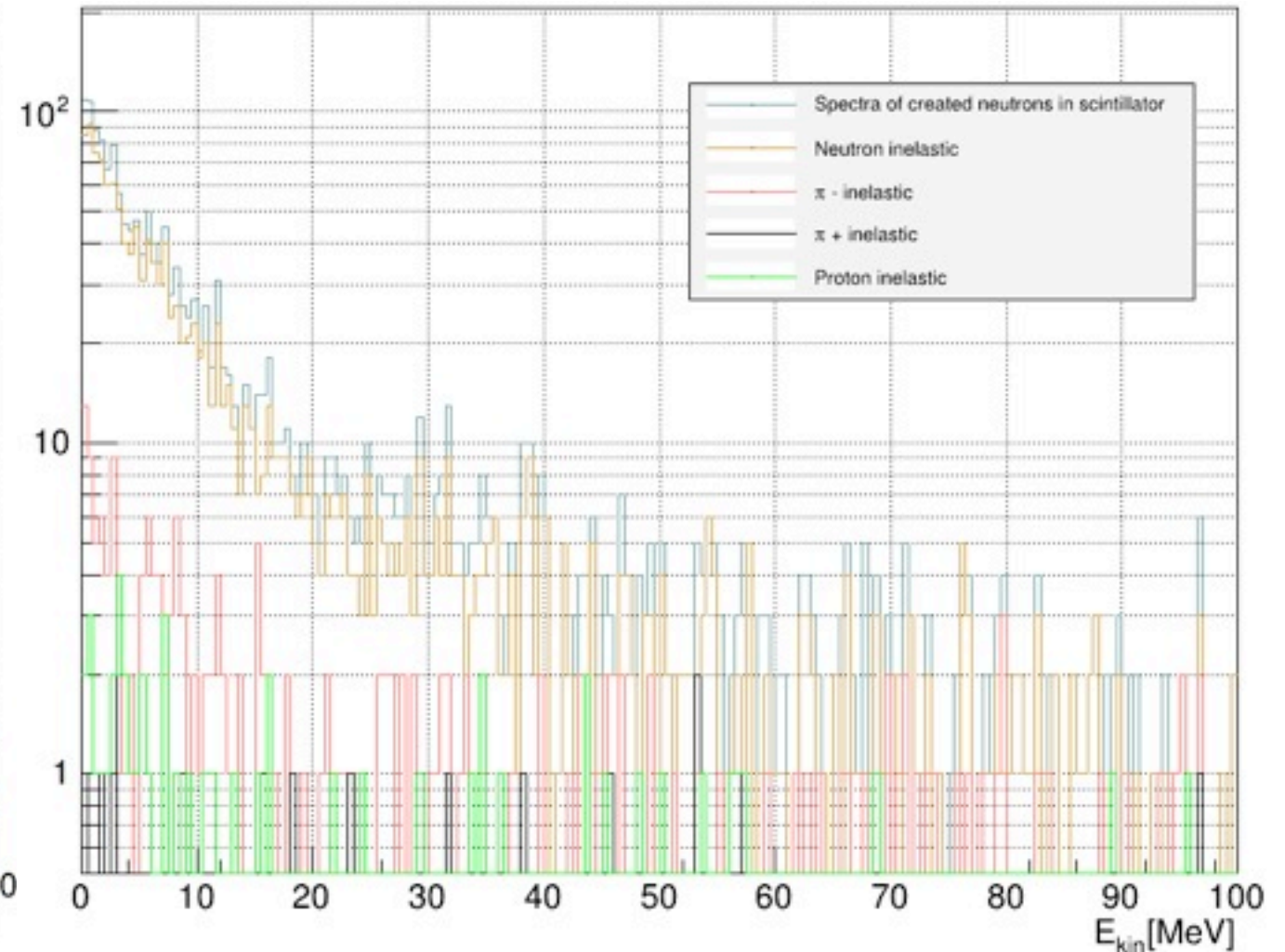- ▸ gdml: tiledsamplingcal4mmpb1mmSz

- ▸ 2.0 GeV pi-
- ▸ 1000 events

Fe4mmSc1mm tiled geometry

How does Pb proton/neutron spectra compares to that of in Fe?
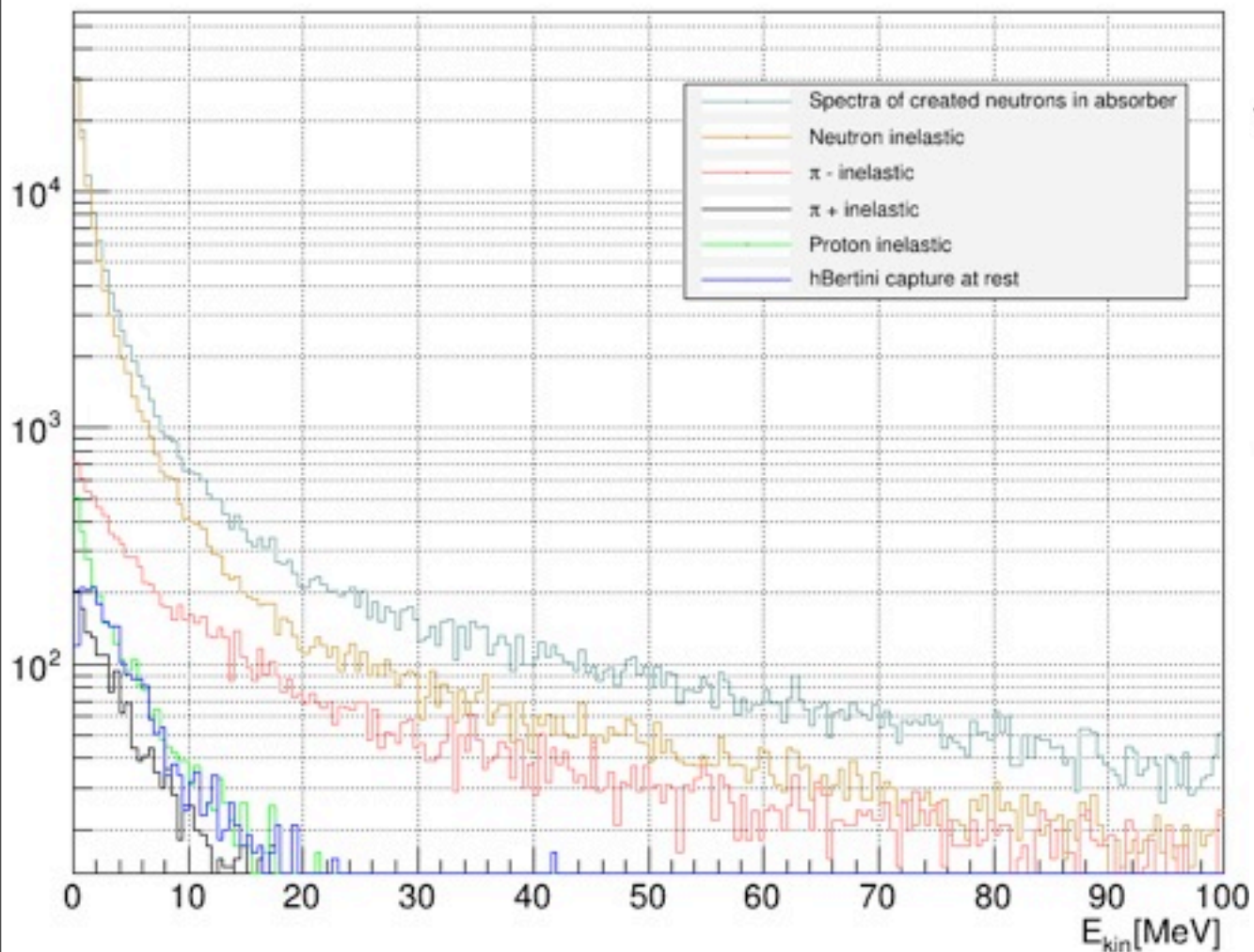
More protons are created in Fe -> Coulomb barrier?

Spectra of created neutrons by process (scint or Fe volume)

- ▸ Geant 4.9.6.p02
- ▸ Physics list: FTFP_BERT
- ▸ gdml: tiledsamplingcal4mmFe1mmSz

- ▸ 5.0 GeV pi-
- ▸ 1000 events

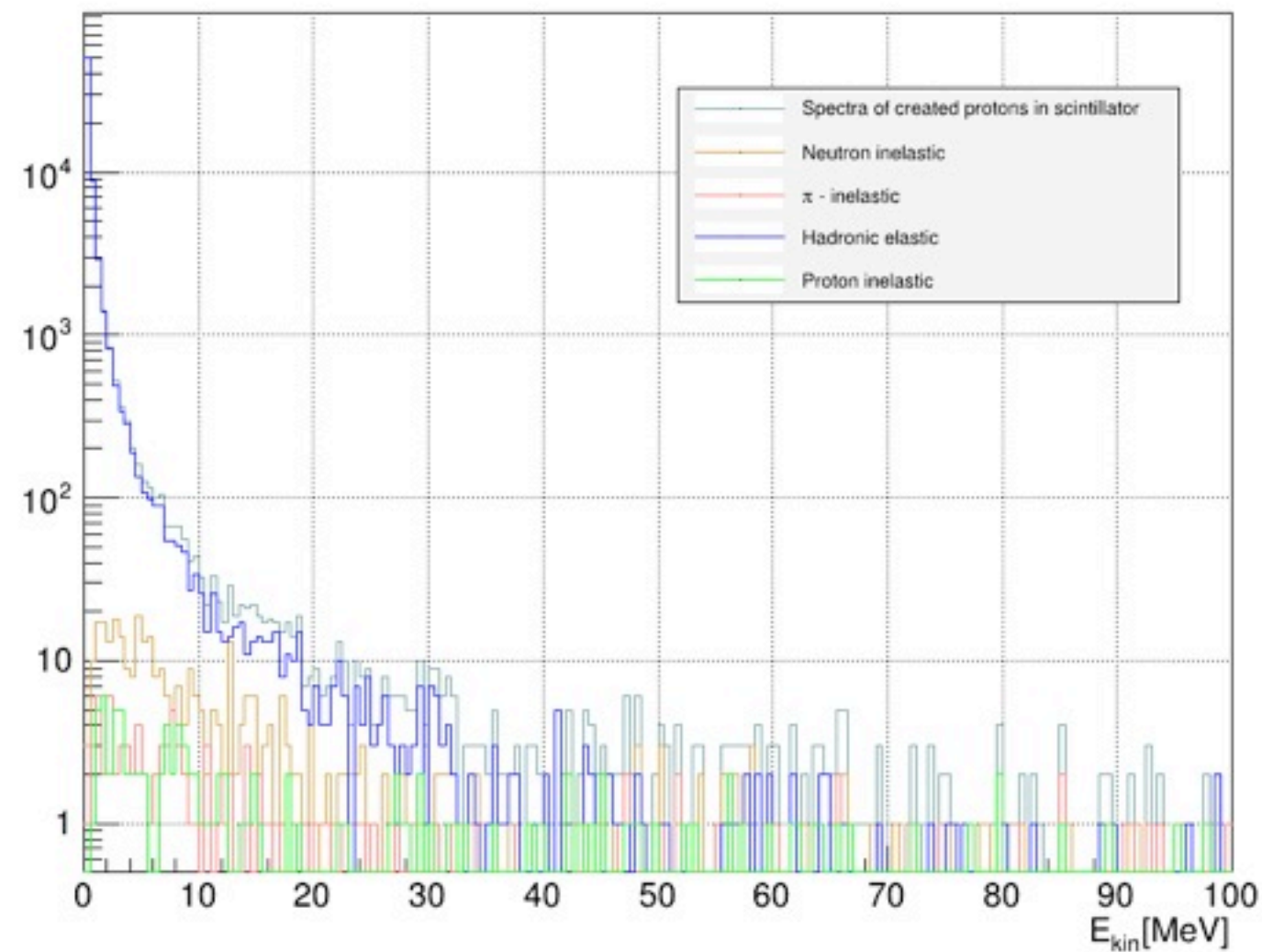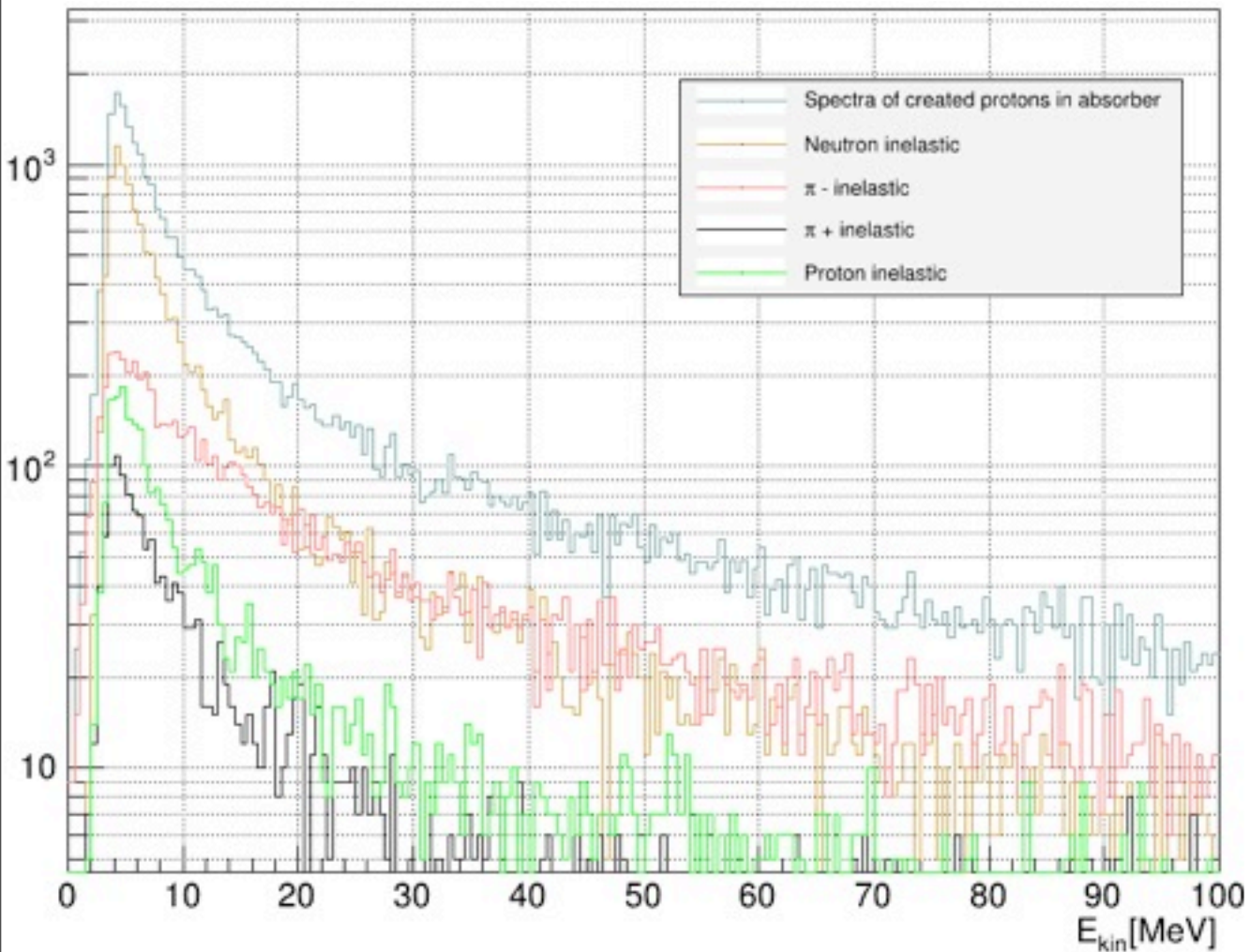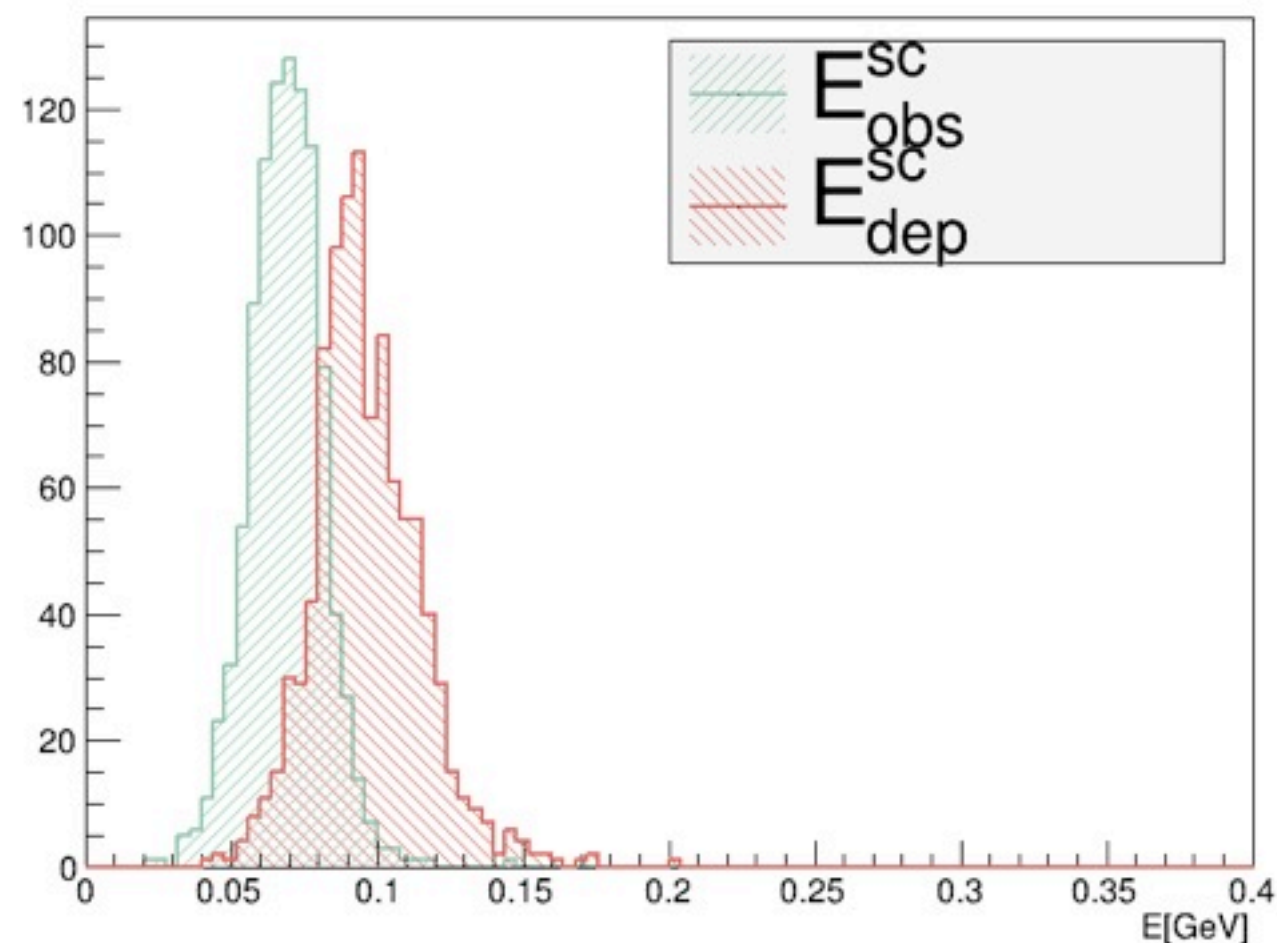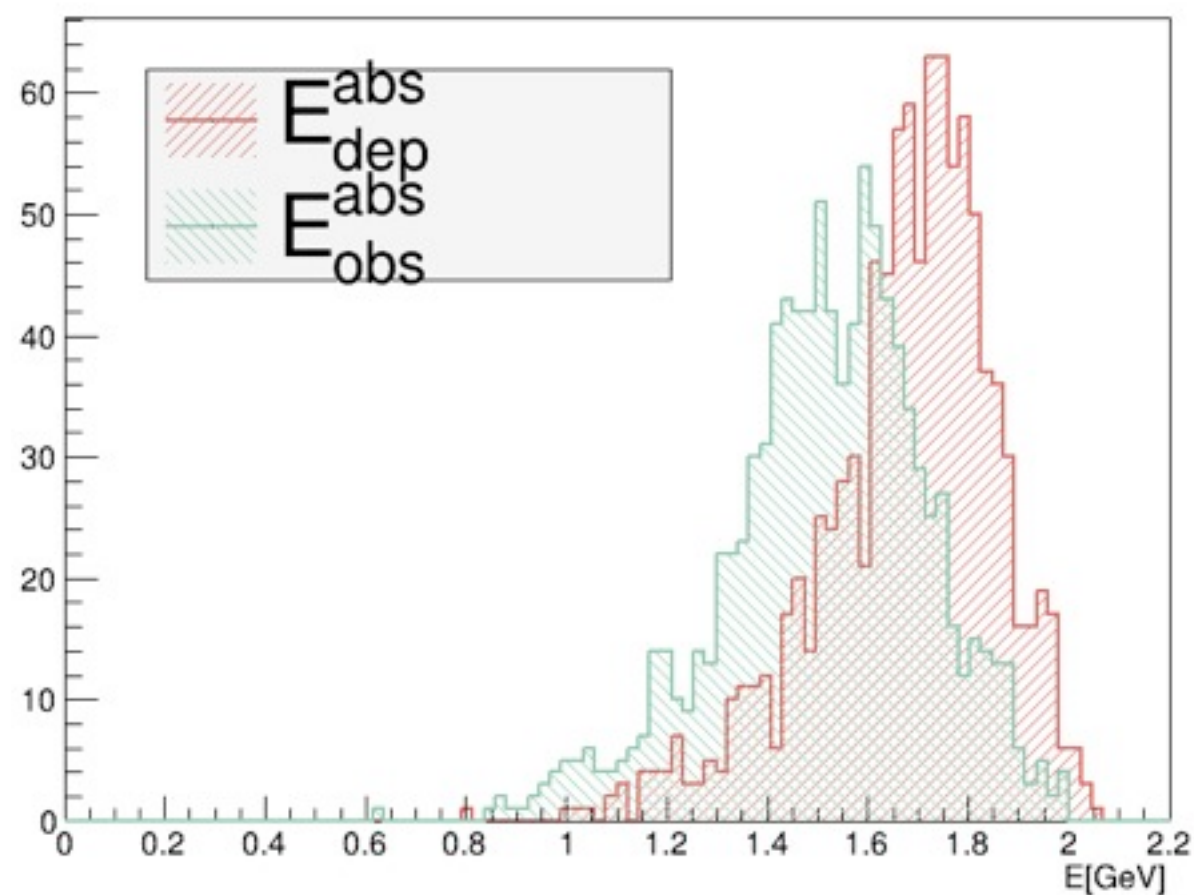# Spectra of created protons by process (scint or Fe volume)

▸ Geant 4.9.6.p02
▸ Physics list: FTFP_BERT
▸ gdml: tiledsamplingcal4mmFe1mmSz

▸ 5.0 GeV pi-
▸ 1000 events

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Birks' suppression in Fe4mmSc1mm sampling calorimeter

- Geant 4.9.6.p02
- Physics list: FTFP_BERT
- gdml: tiledsamplingcal4mmFe1mmSz
- 2.0 GeV pi-
- 1000 events

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