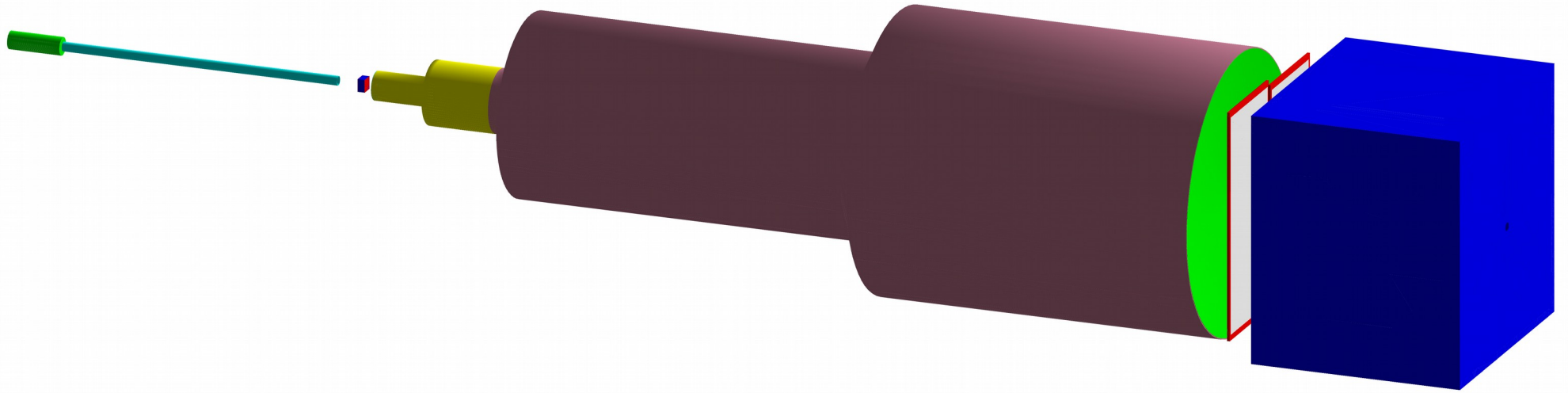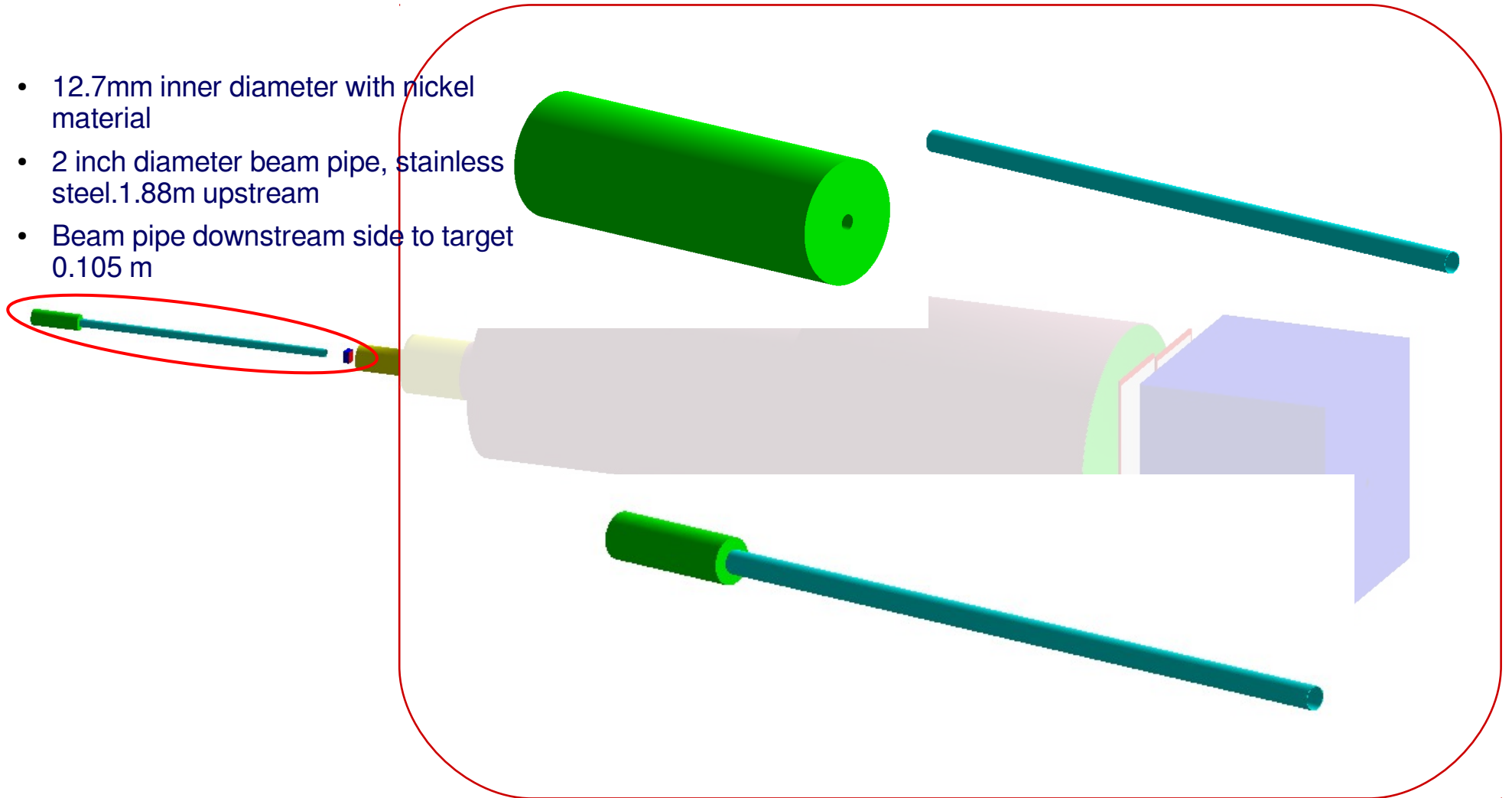# Simulation setup review

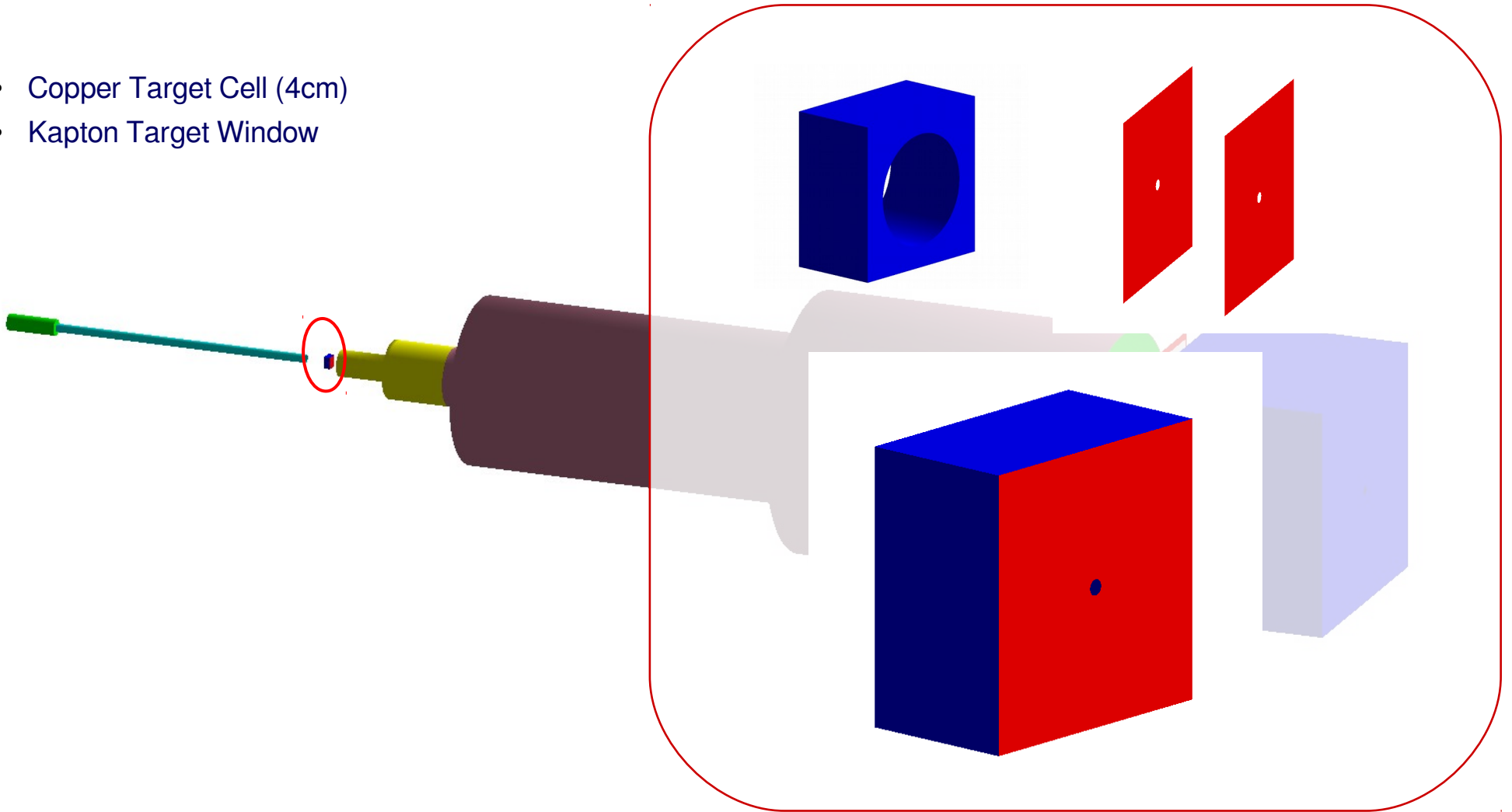# Simulation setup

- 12.7mm inner diameter with nickel material
- 2 inch diameter beam pipe, stainless steel.1.88m upstream
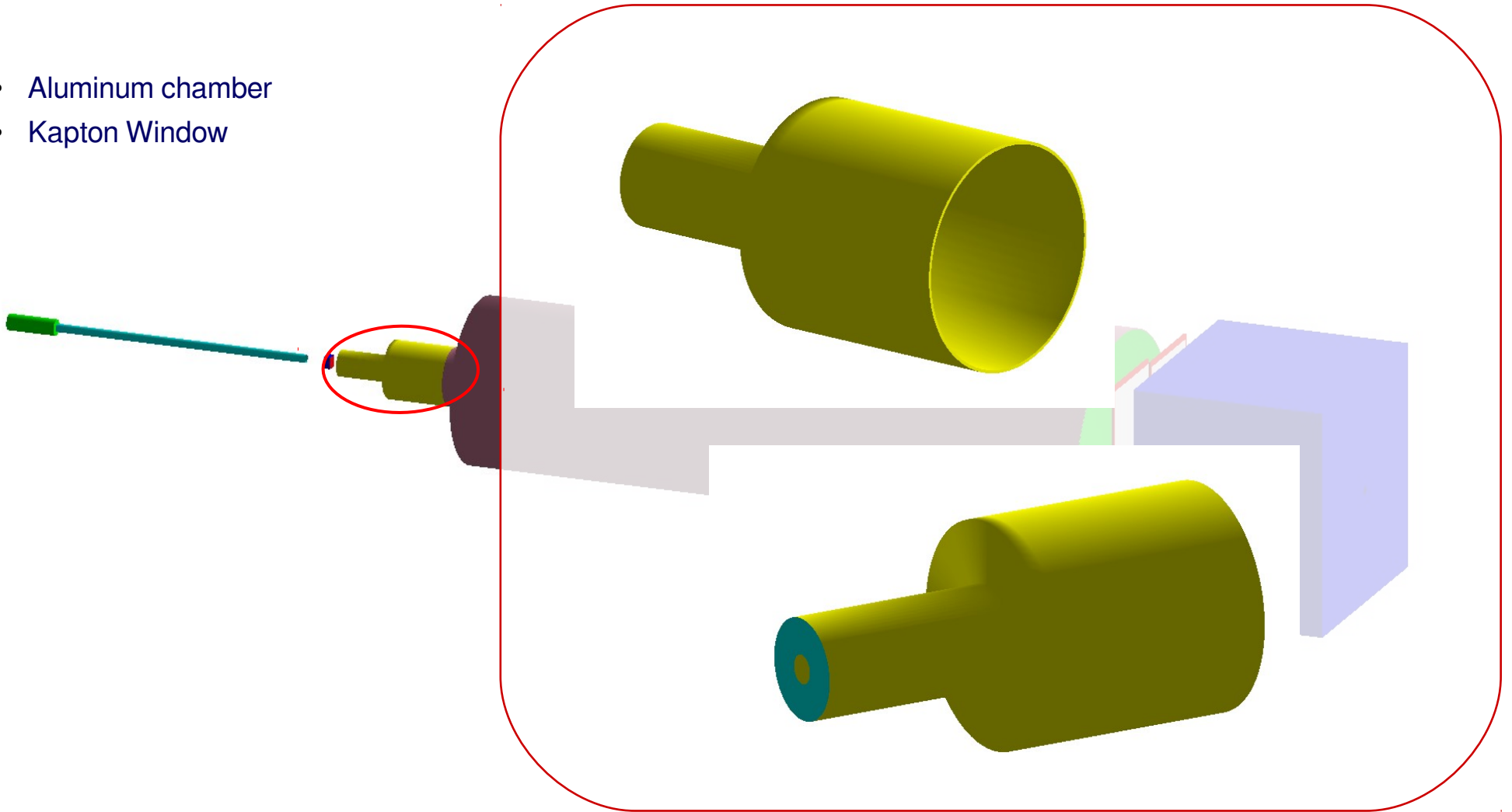- Beam pipe downstream side to target 0.105 m

Simulation setup
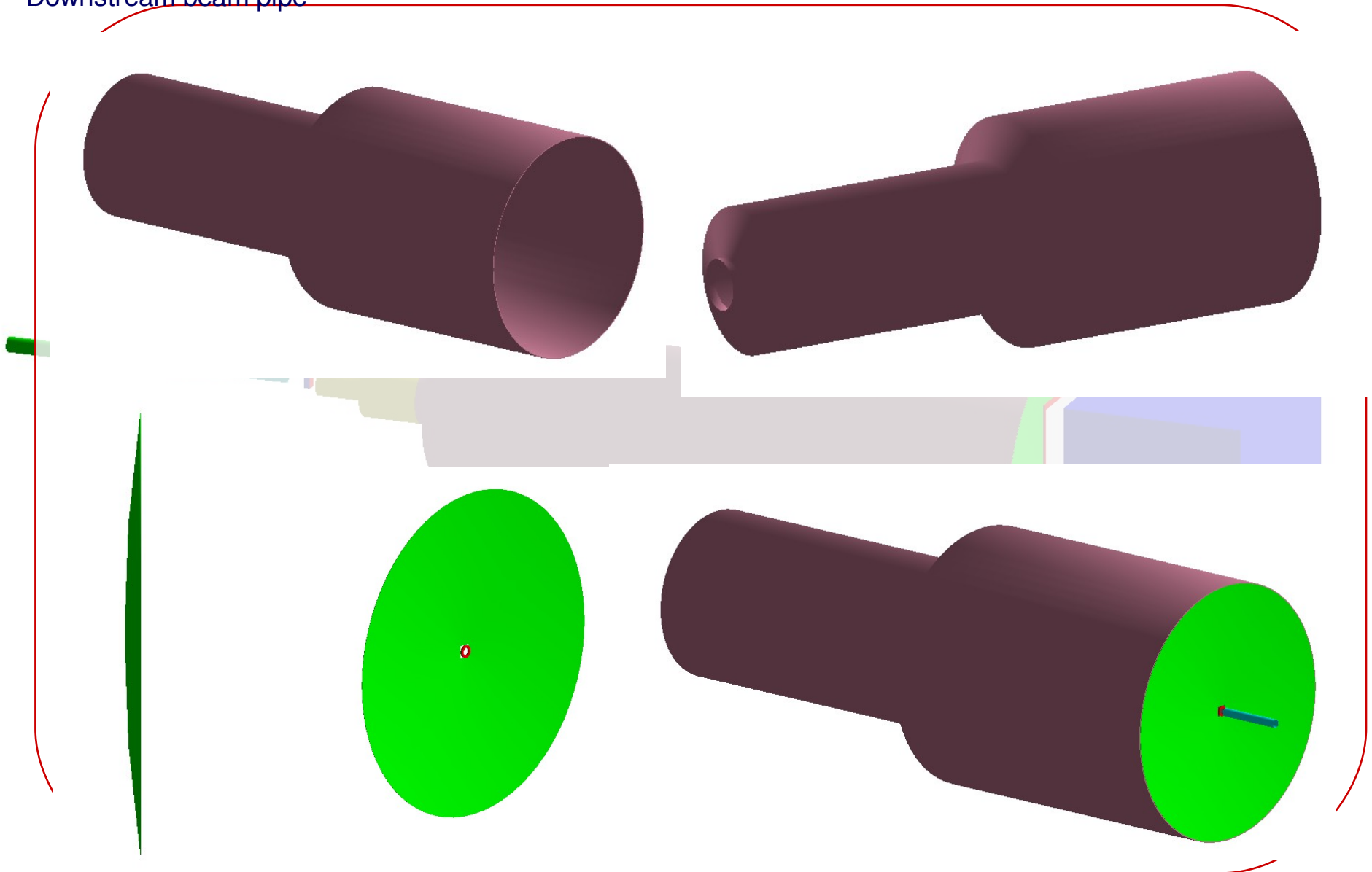
- Copper Target Cell (4cm)
- Kapton Target Window

Simulation setup

- Aluminum chamber
- Kapton Window

- Vacuum chamber
- Vacuum chamber window
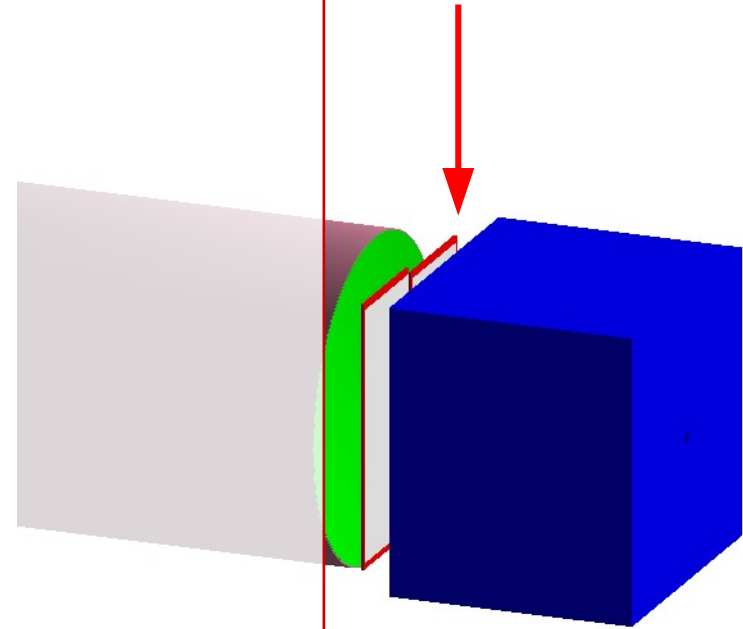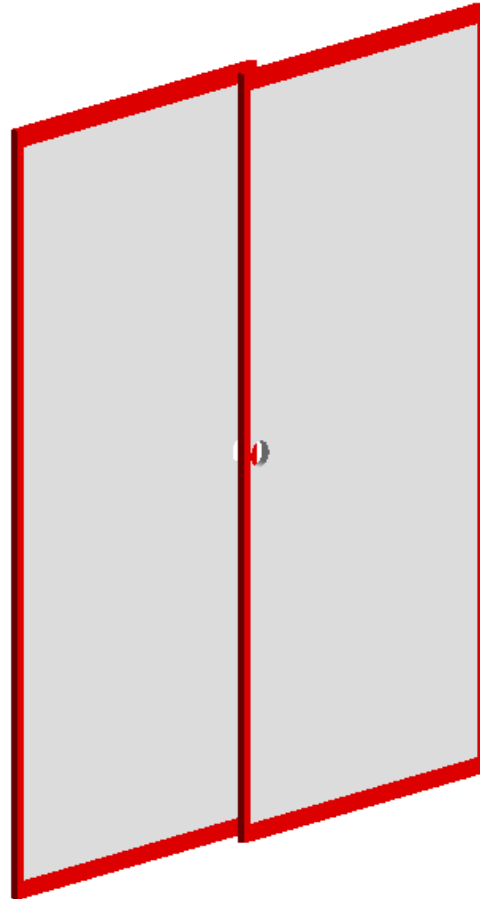- Flange
- Downstream beam pipe
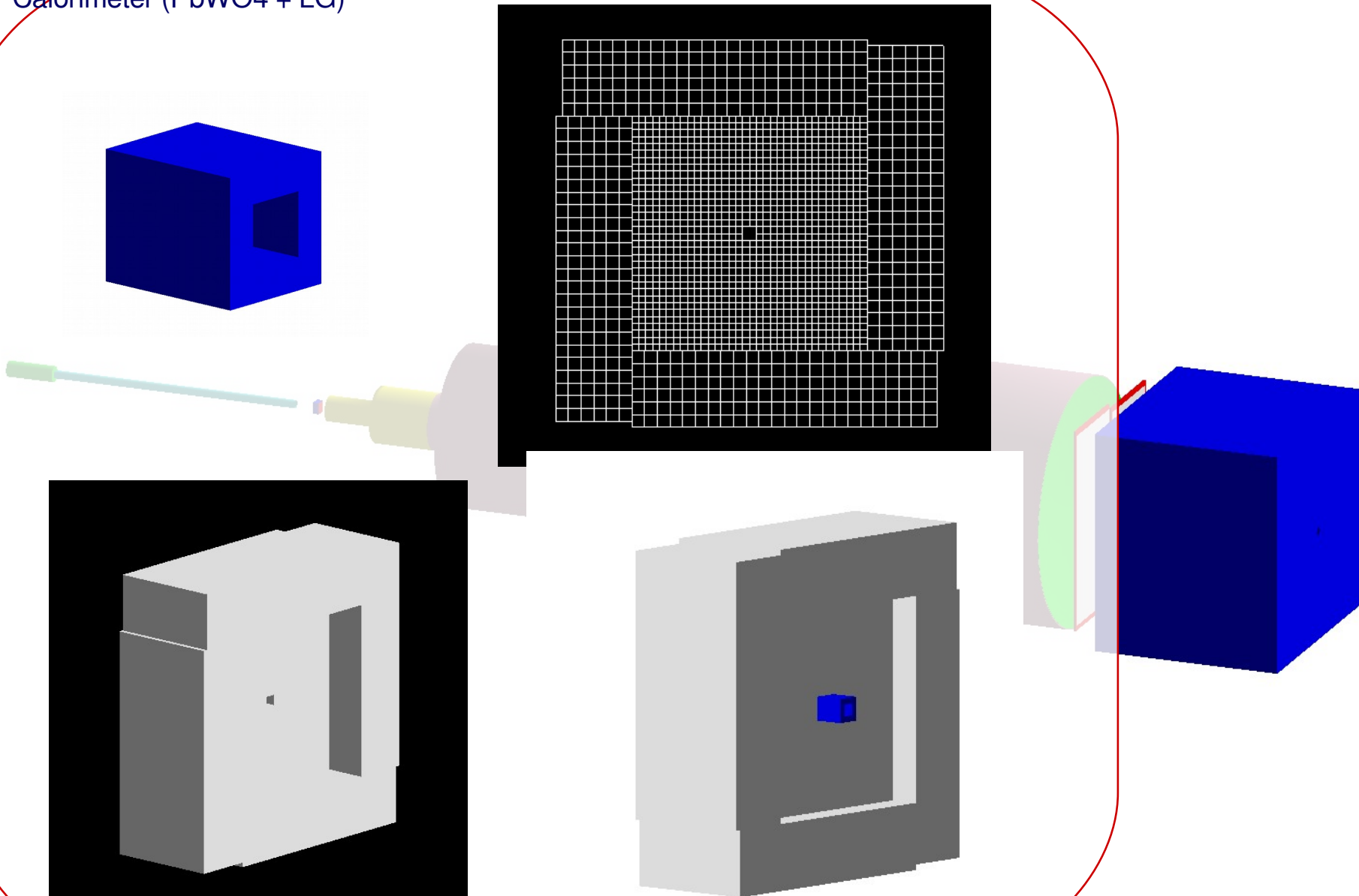
Simulation setup

GEM assembly

- 3 GEM foil (Cu(5um) + Kapton(50um) + Cu(5um))
- 2 Window (Kapton (25um))
- 1 Cathode (Kapton (25um) + Cu(5um))
- R/O (Cu + Kapton)
- 2 layers G10/Fr4 sheets
- 1 layer G10 Foam
- 5 layers Spacers (G10)
- A glue layer (AY103+HD991)
- Ar/CO_2 gas

From Chao Gu
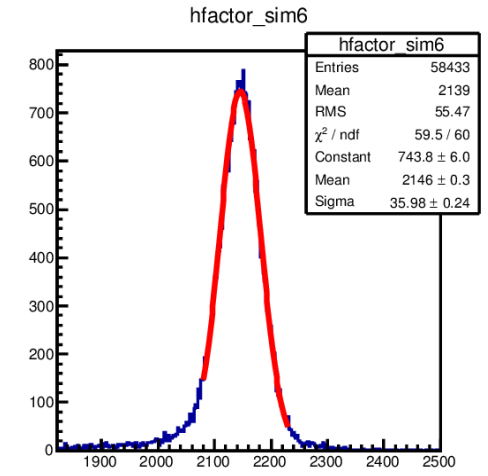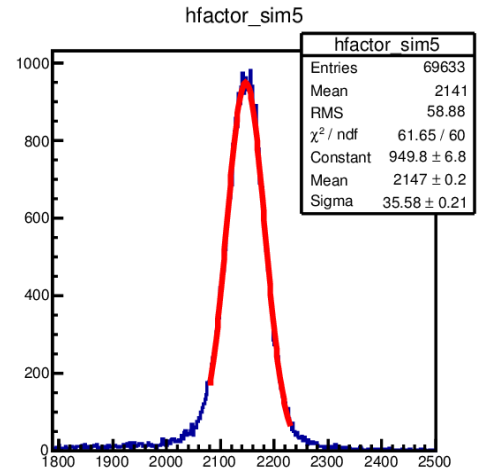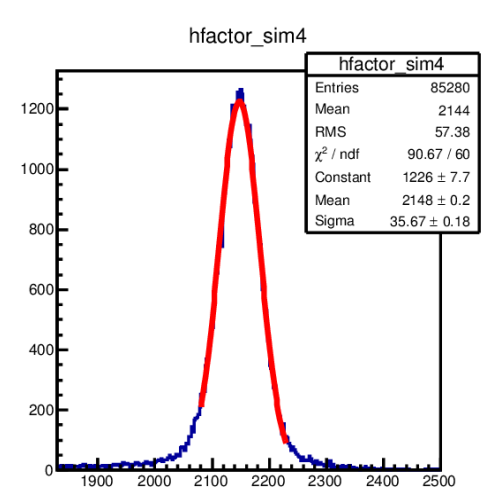
6

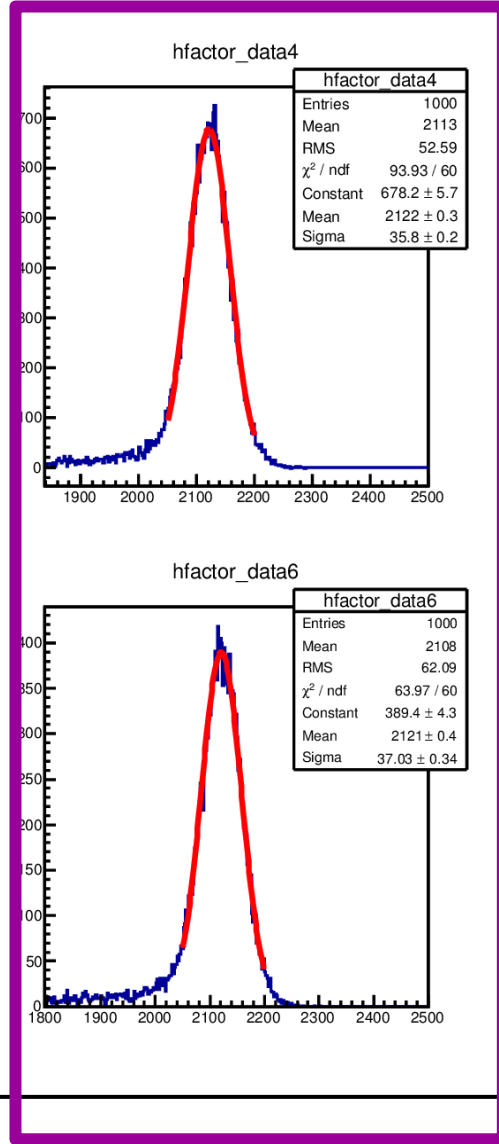# Simulation setup

- Tungstun collimator
- Calorimeter (PbWO4 + LG)

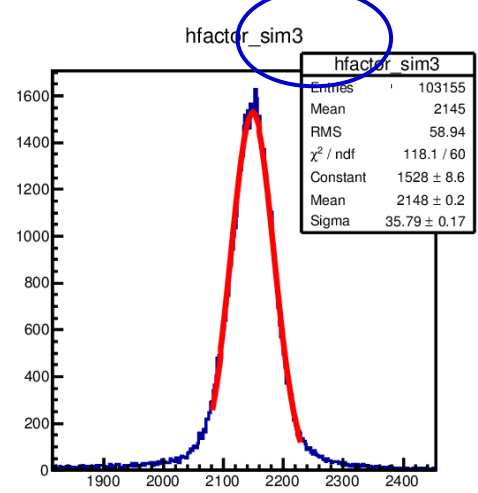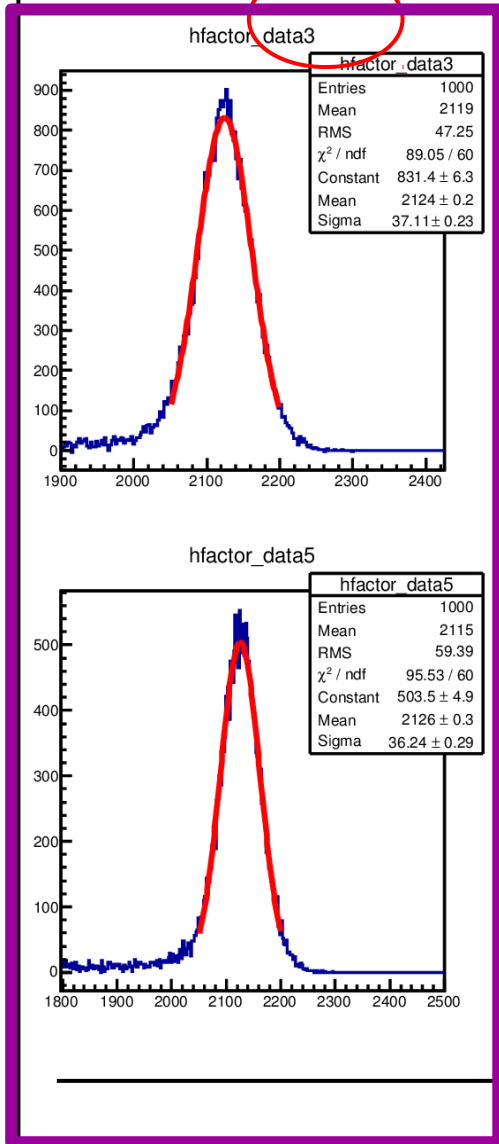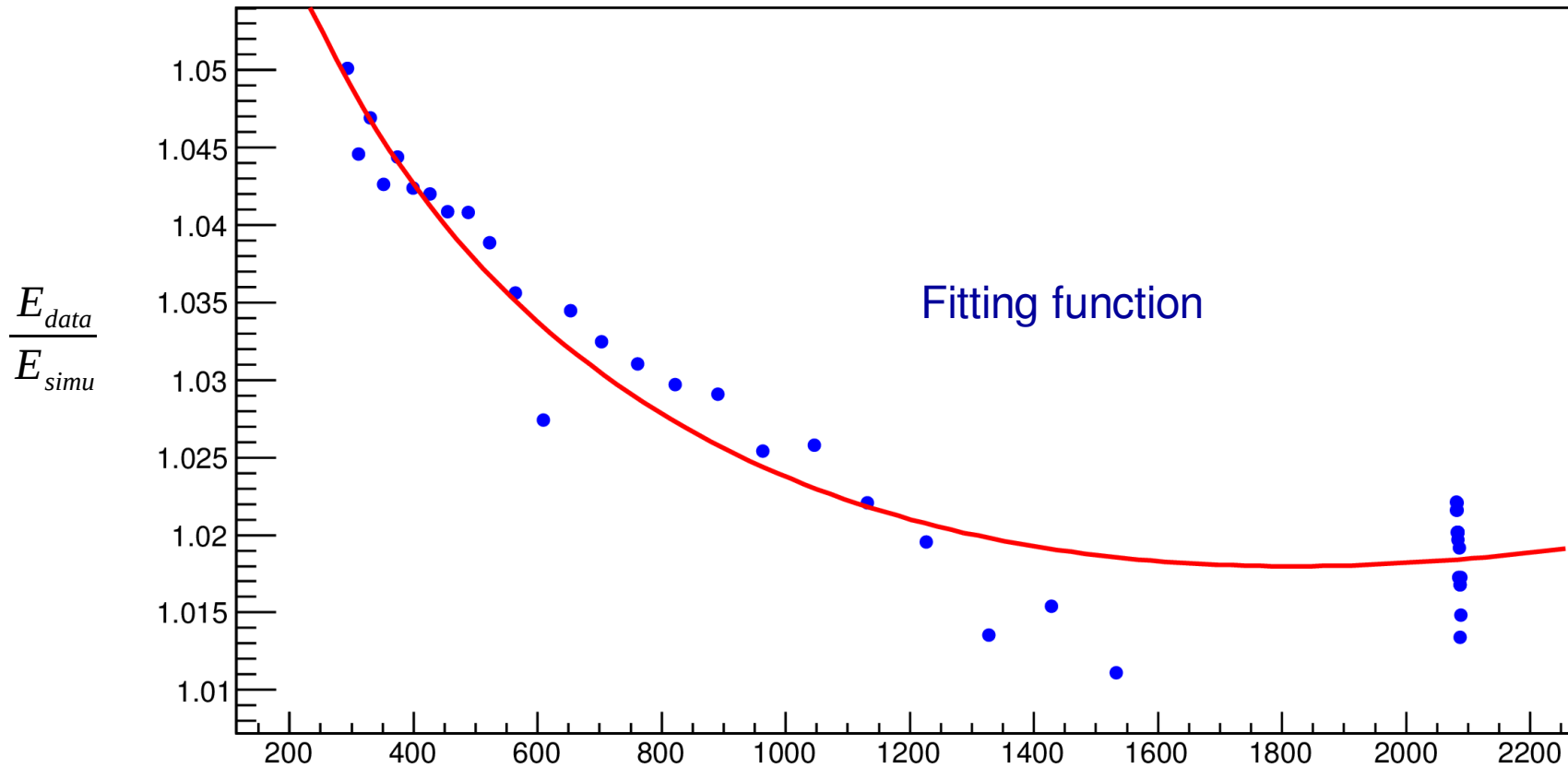# 2.141 GeV simulation

2.141 GeV simulation config

Cluster energy

Reconstructed cluster energy sigma compare simulation and data

Match between simulation and data within a few MeV

2.141 GeV simulation config

Graph

$$\frac{E_{data}}{E_{simu}}$$

Fitting function

$$E = \left\{ p_3 \times exp\left(p_2 \times \sqrt{E_{simu}/2140} \right) + p_1 \times E_{simu} + p_0 \right\} \times E_{simu}$$

$p_3 = 0.950135$

$p_2 = -0.351049$

$p_1 = 3.5904E\text{-}05$

$p_0 = 0.549588$

2.141 GeV simulation config

1.1 − 1.2 degree ep

hfactor_data3	
Entries	1000
Mean	508.7
RMS	618.9

1.1 − 1.2 degree ee

hfactor_data3	
Entries	1000
Mean	508.7
RMS	618.9

2.8 − 1.9 degree ee

hfactor_data15	
Entries	1000
Mean	524
RMS	344.8

1.8 − 1.9 degree ep

hfactor_data8	
Entries	1000
Mean	609.5
RMS	543.5

1.8 − 1.9 degree ee
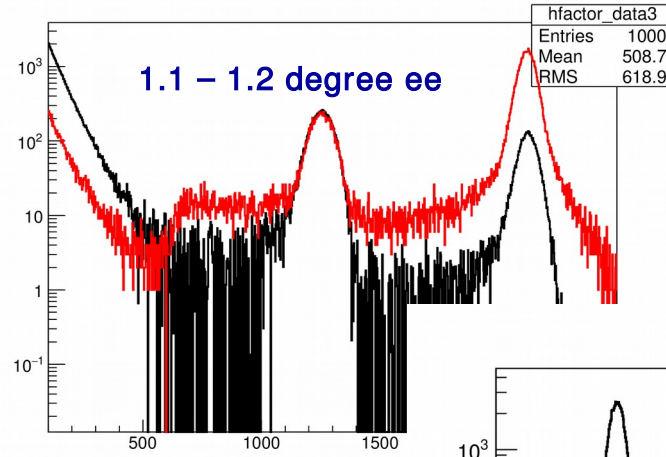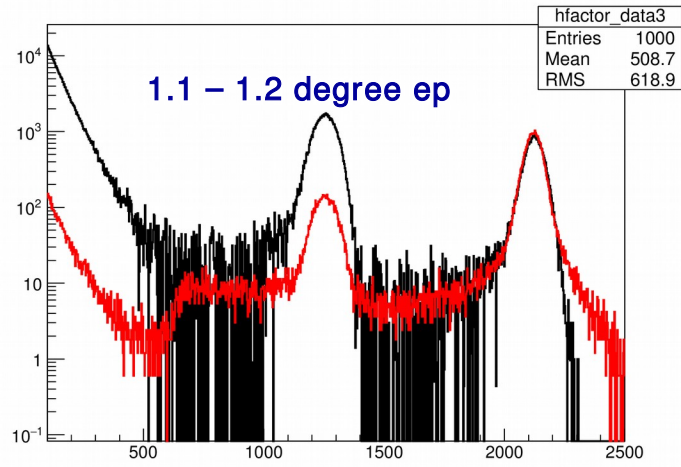
1.1 GeV simulation

1.1 GeV simulation config
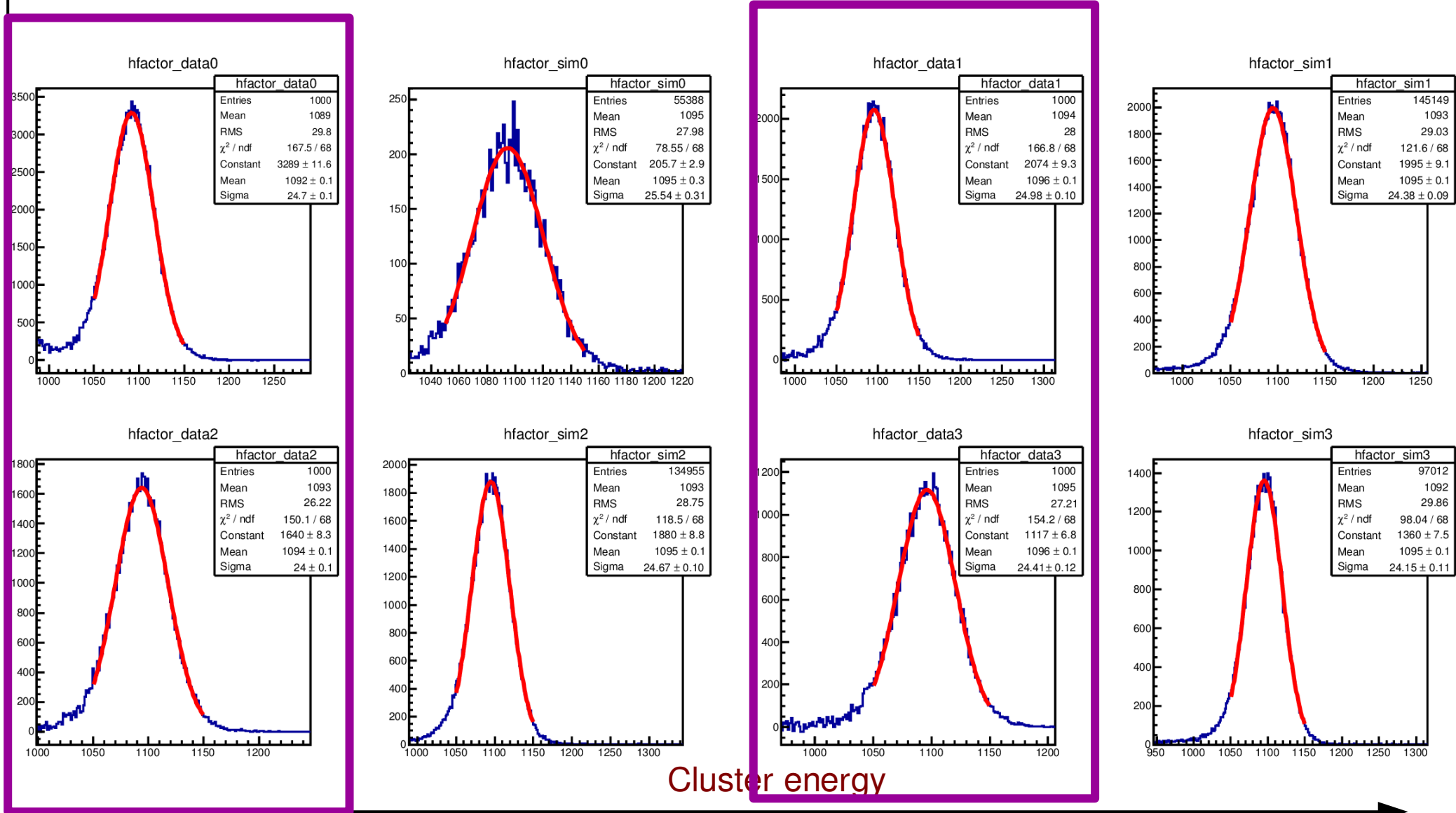
Cluster energy

Reconstructed cluster energy sigma compare simulation and data

Match between data and simulation within a few MeV

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1.1 GeV simulation config

> 2.8 degree sigma compare
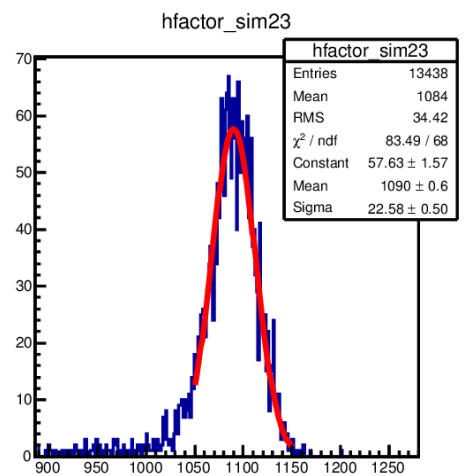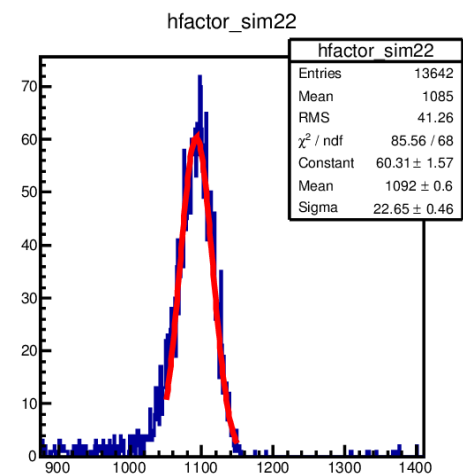
Cluster energy

Reconstructed cluster energy sigma compare simulation and data

14

1.1 GeV simulation config
Graph

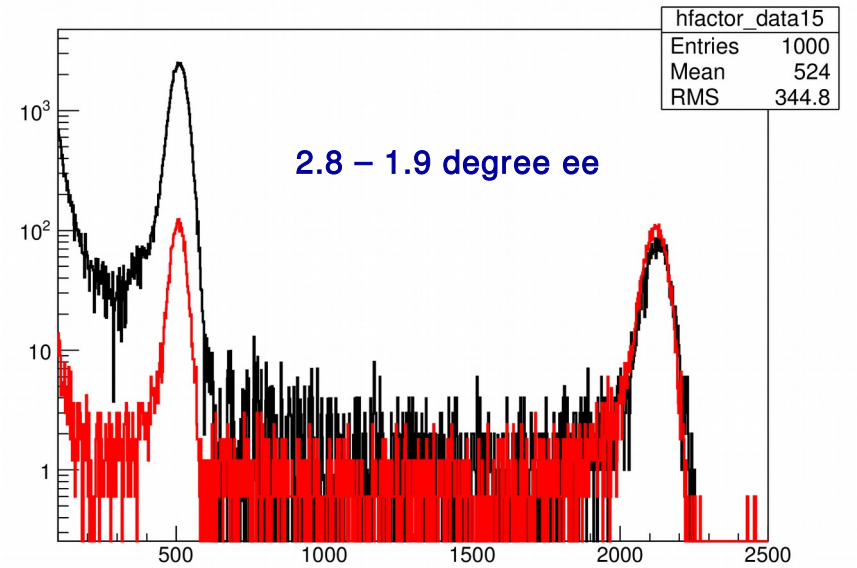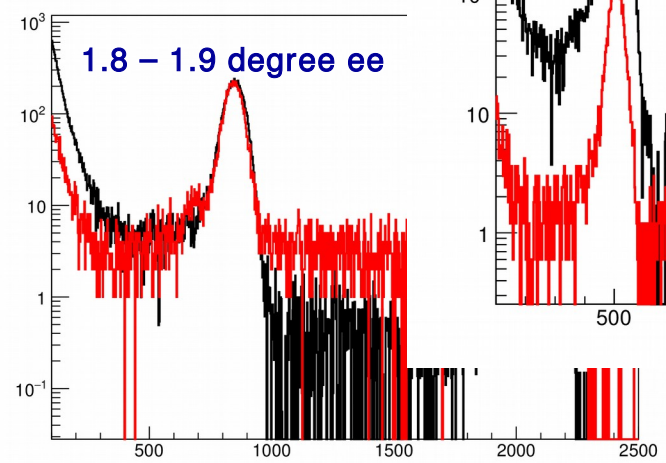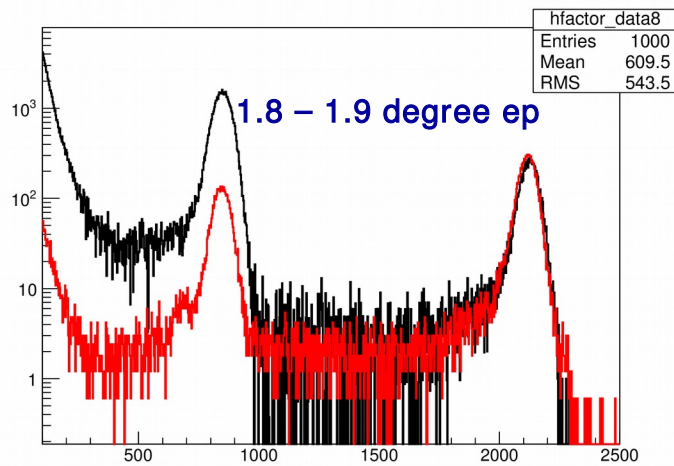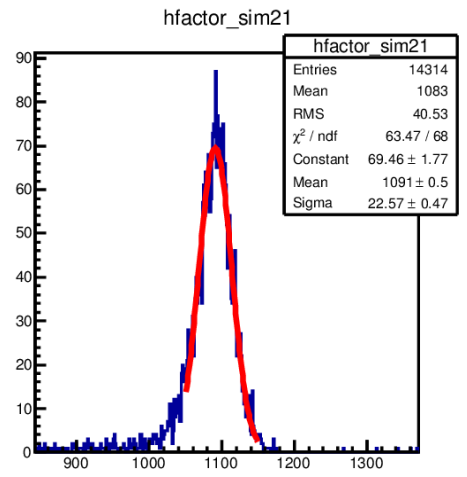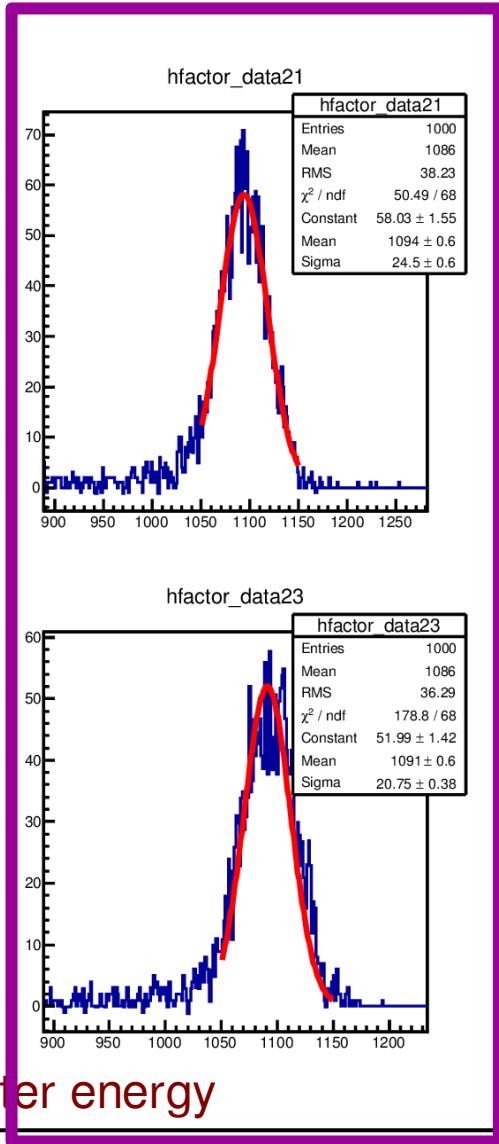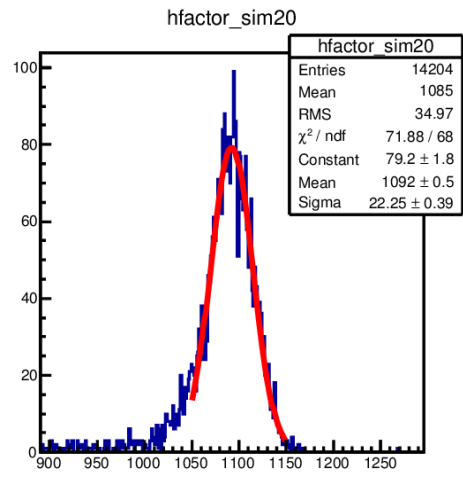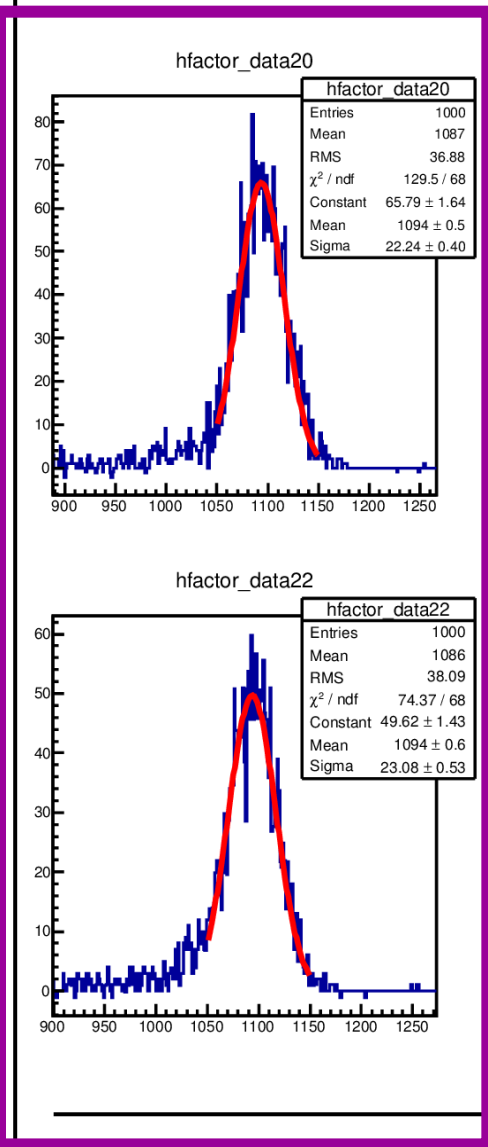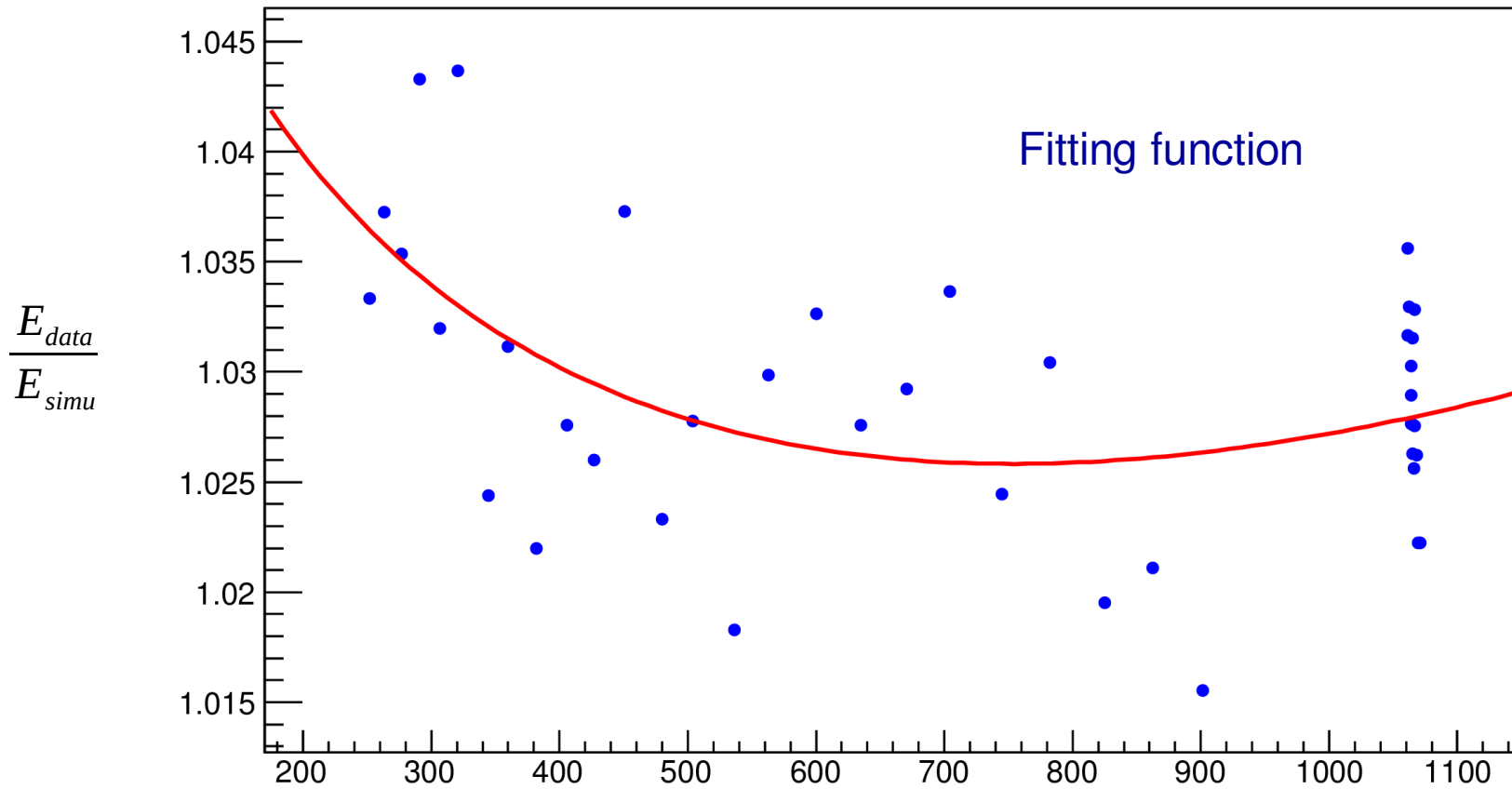$$E=\{p_3 \times exp(p_2 \times \sqrt{E_{simu}/1100}) + p_1 \times E_{simu} + p_0\} \times E_{simu}$$

$p_3 = 0.539865$

$p_2 = -0.271654$

$p_1 = 6.43518E\text{-}05$

$p_0 = 0.546174$