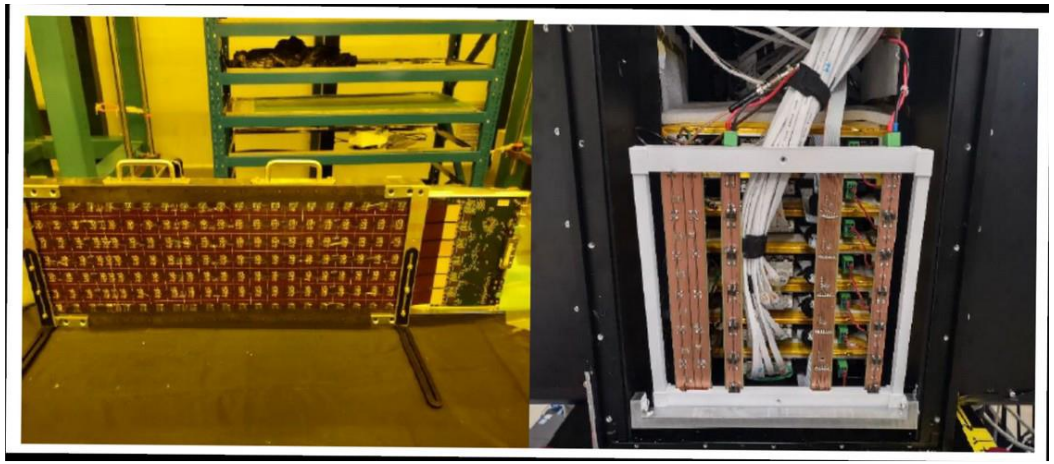
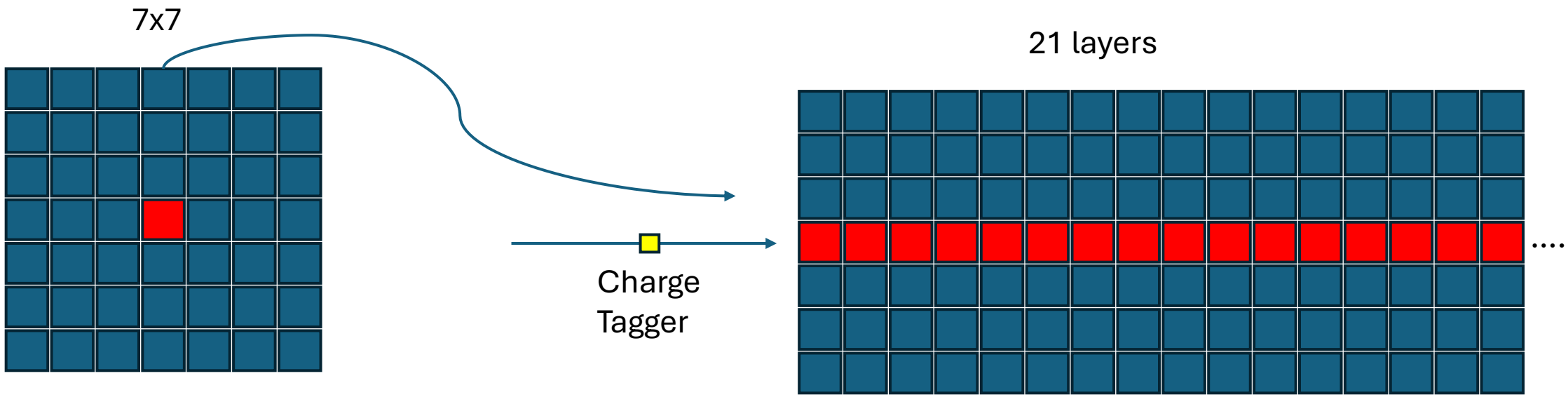
VERY PRELIMINAR ANALYSIS OF HADRONS INTERACTIONS AT «SPS TB2023»



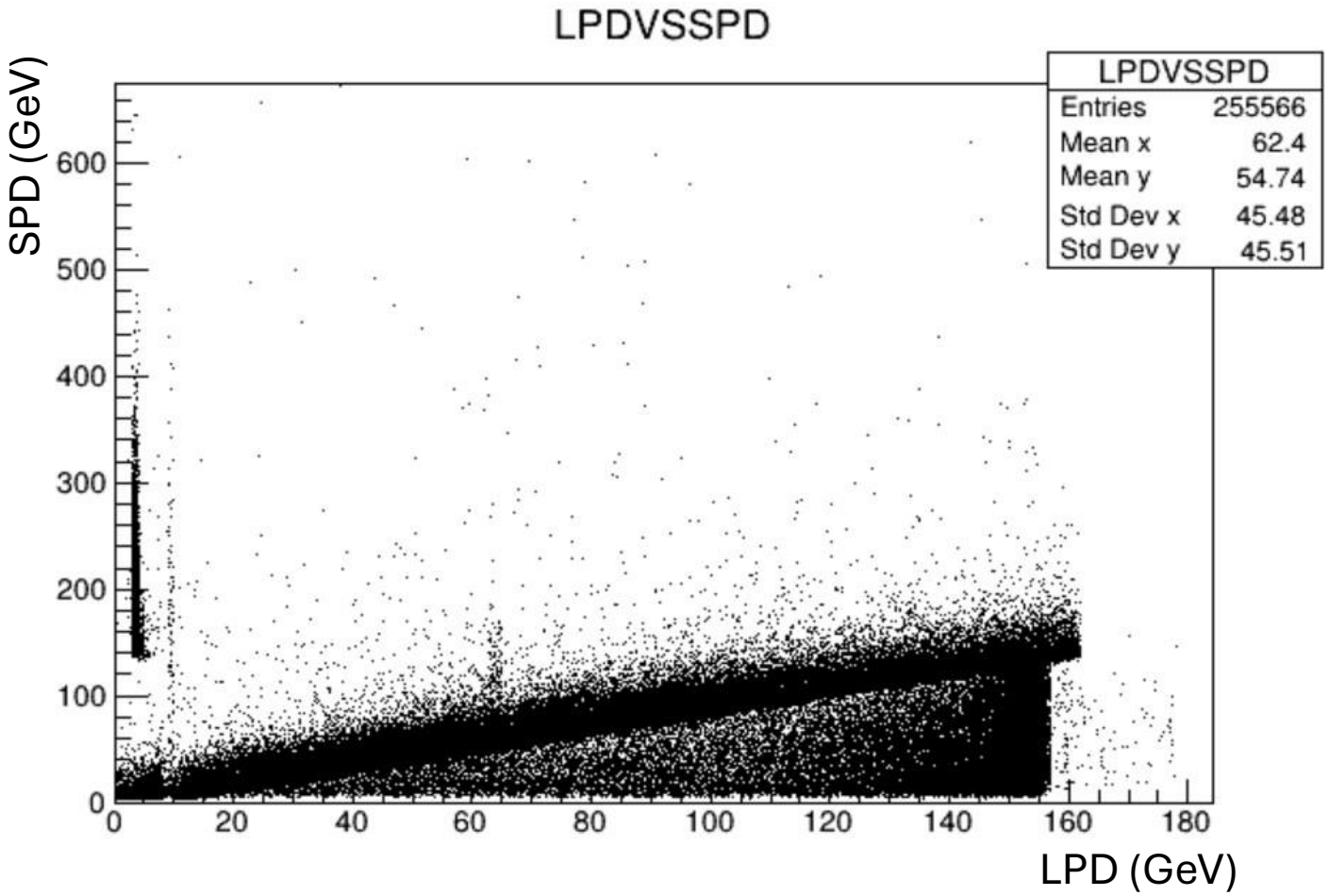


first , second , third .....CUBE are Lyso cube along the BEAM and belonging to first , second , third LAYER

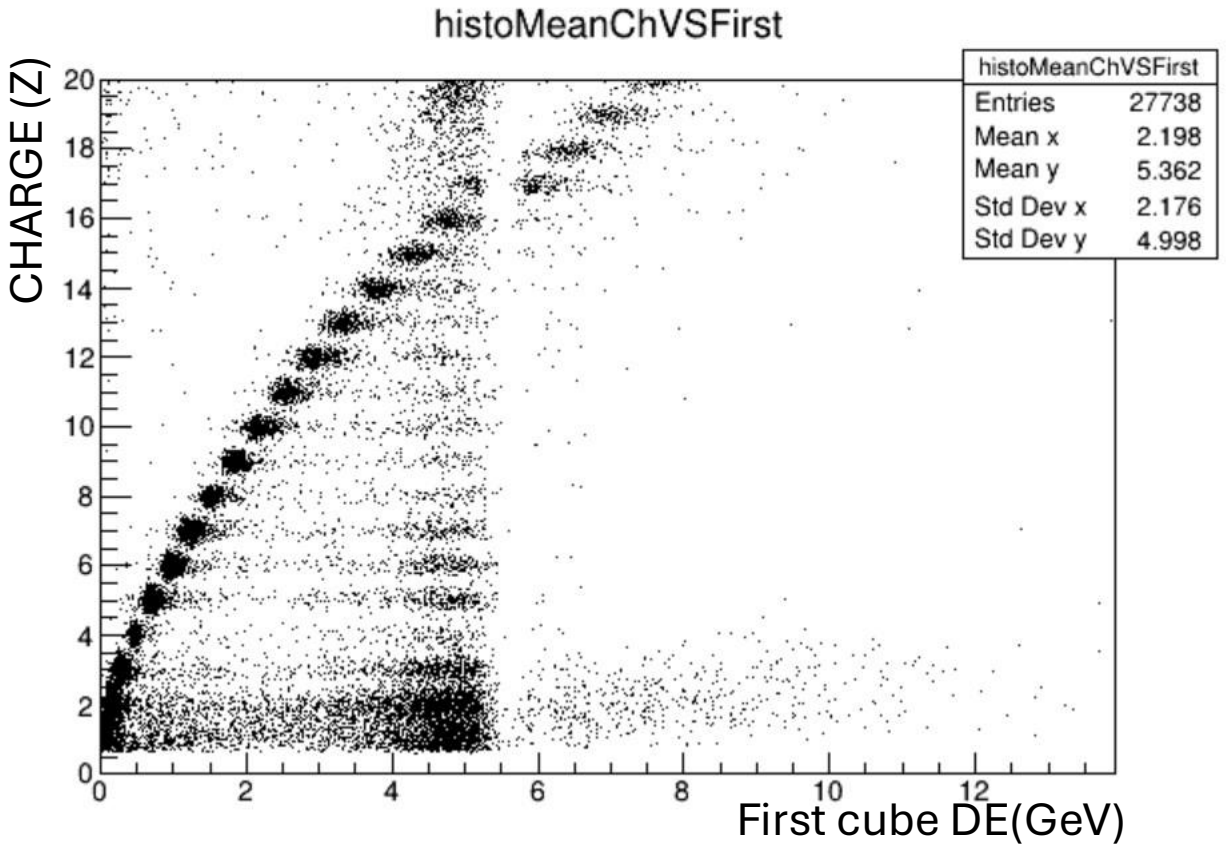
- This analysis consider event only from RUN 484 (with good casis time)

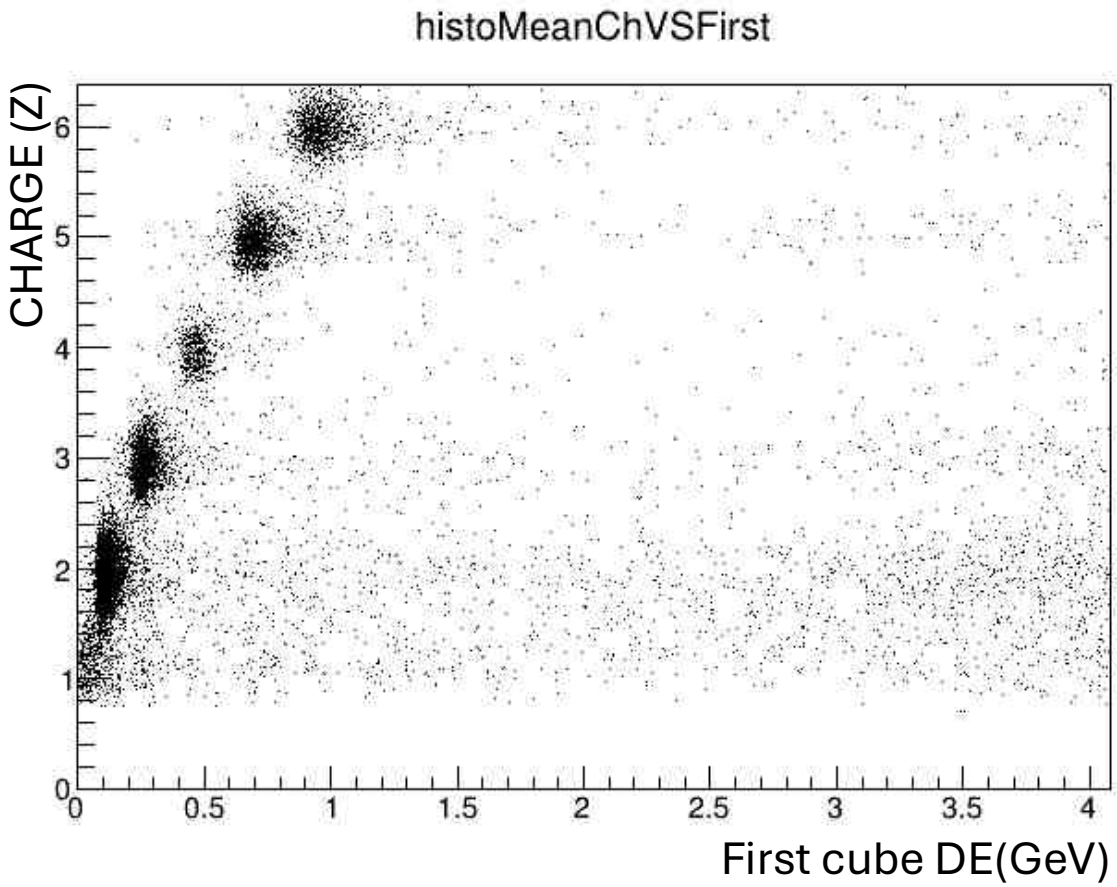
- LPD : Pietro Calibration + ‘average calibration’ for cube not included in Pietro Calibration (ONLY 3X5 CALO CORE)
- SPD : an «average» calibration factor is applied for every SPD (LPD saturation flag does not work ?)

- In the present analysis (Z=2,5,6) NO LPD SATURATES



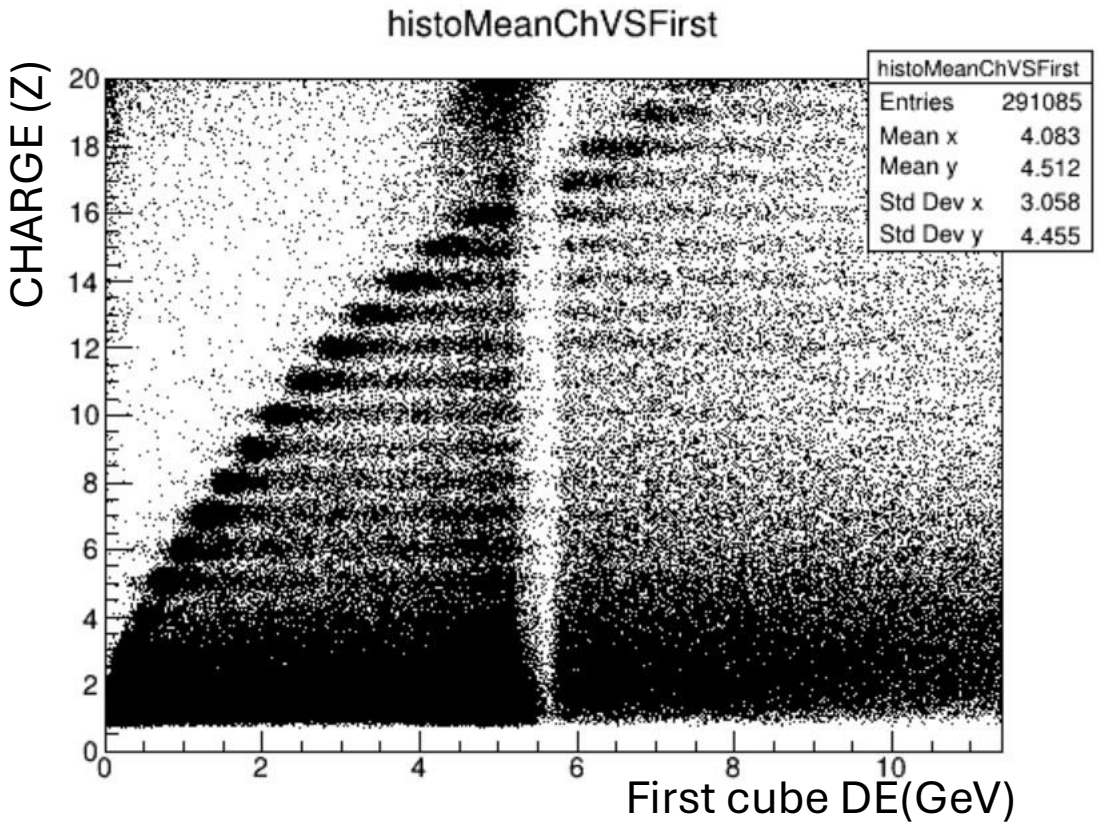
WITH : ChargeTagger coincidence (6 layer) and quiet first layer around first cube

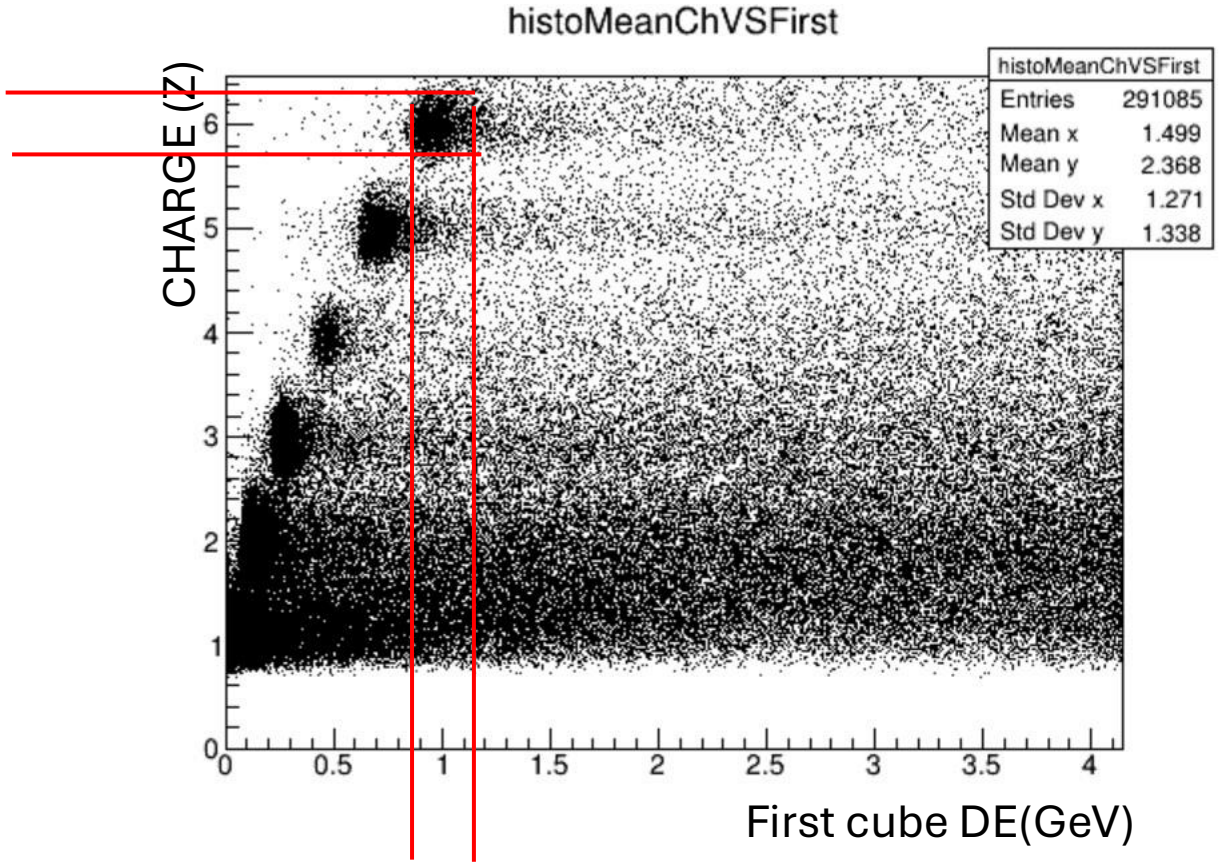




first , second , third .....CUBE are Lyso cube along the BEAM and belonging to first , second , third LAYER

WITH : total ChargeTagger coincidence (6 layer)



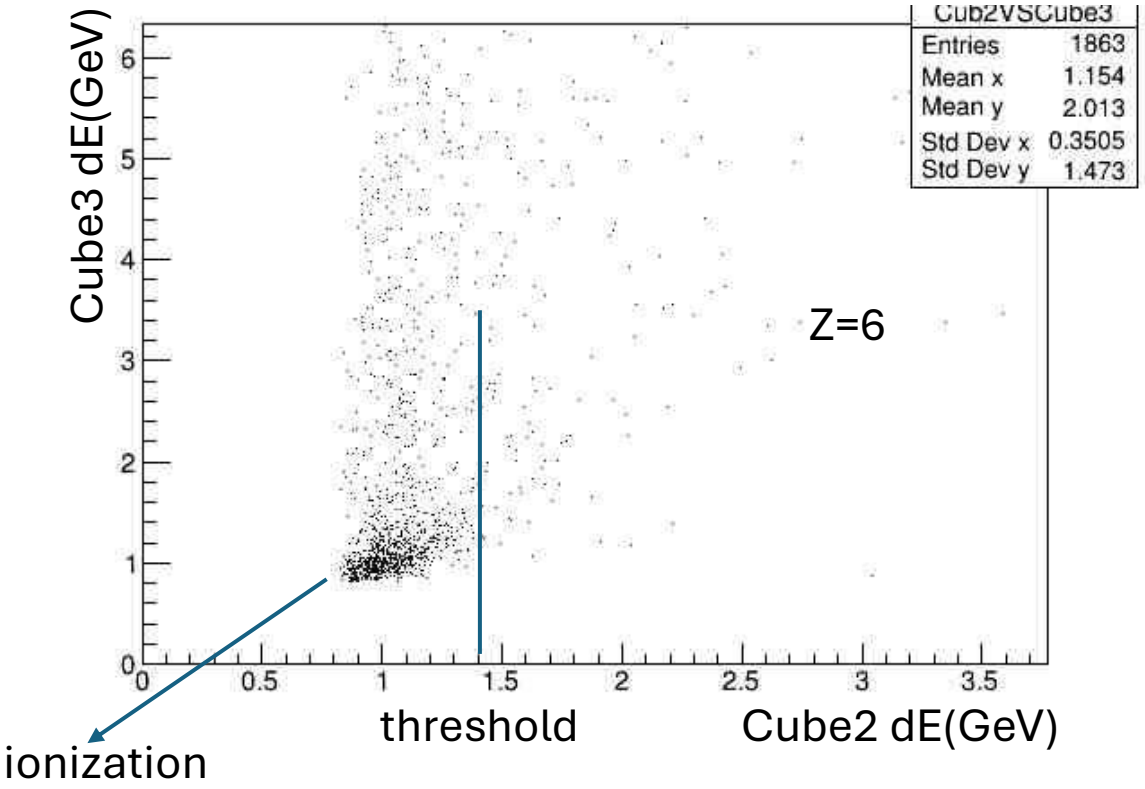


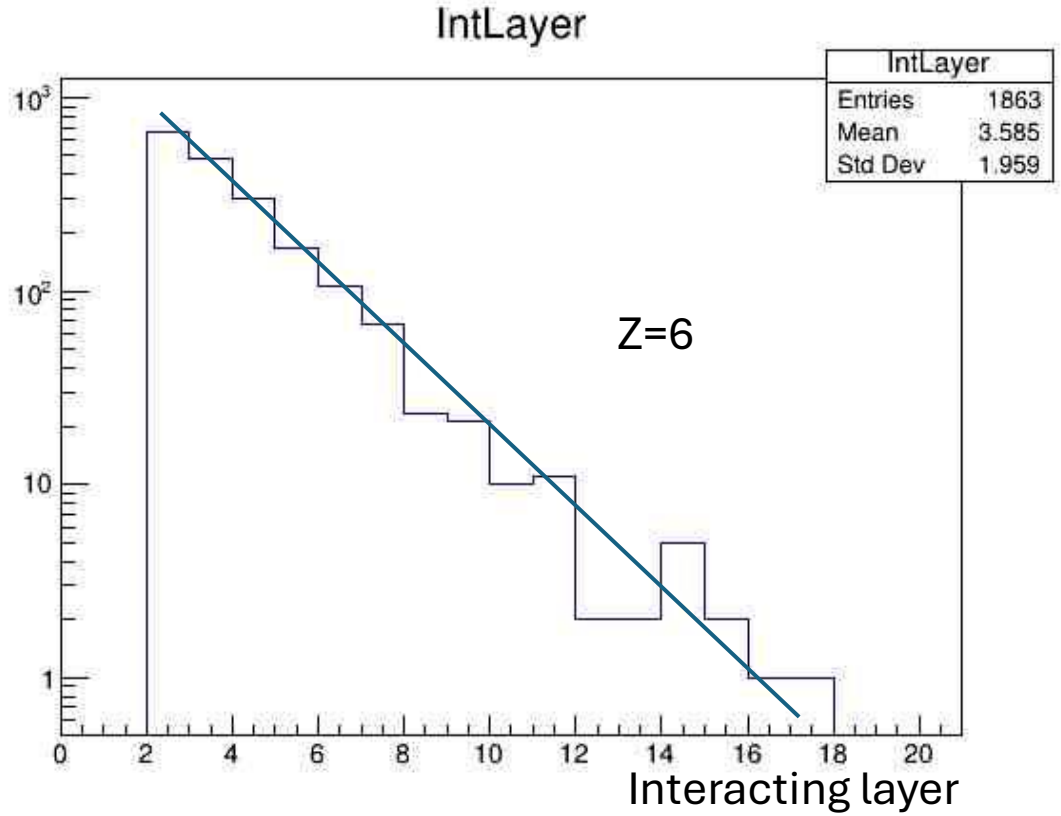
For each nucleus we selected events with coincidence in CHARGE TAGGER and First Cube
Then we analyzed the CALO signals looking for first nuclear interaction starting from second layer

RESEARCH OF THE FIRTS NUCLEAR INTERACTION POINT (cube)

The «Interacting» cube is identified looking at **the first cube along beam with signal above threshold** , asking also to **exhibit a stronger signal in the successive layer** (starting from the second layer)

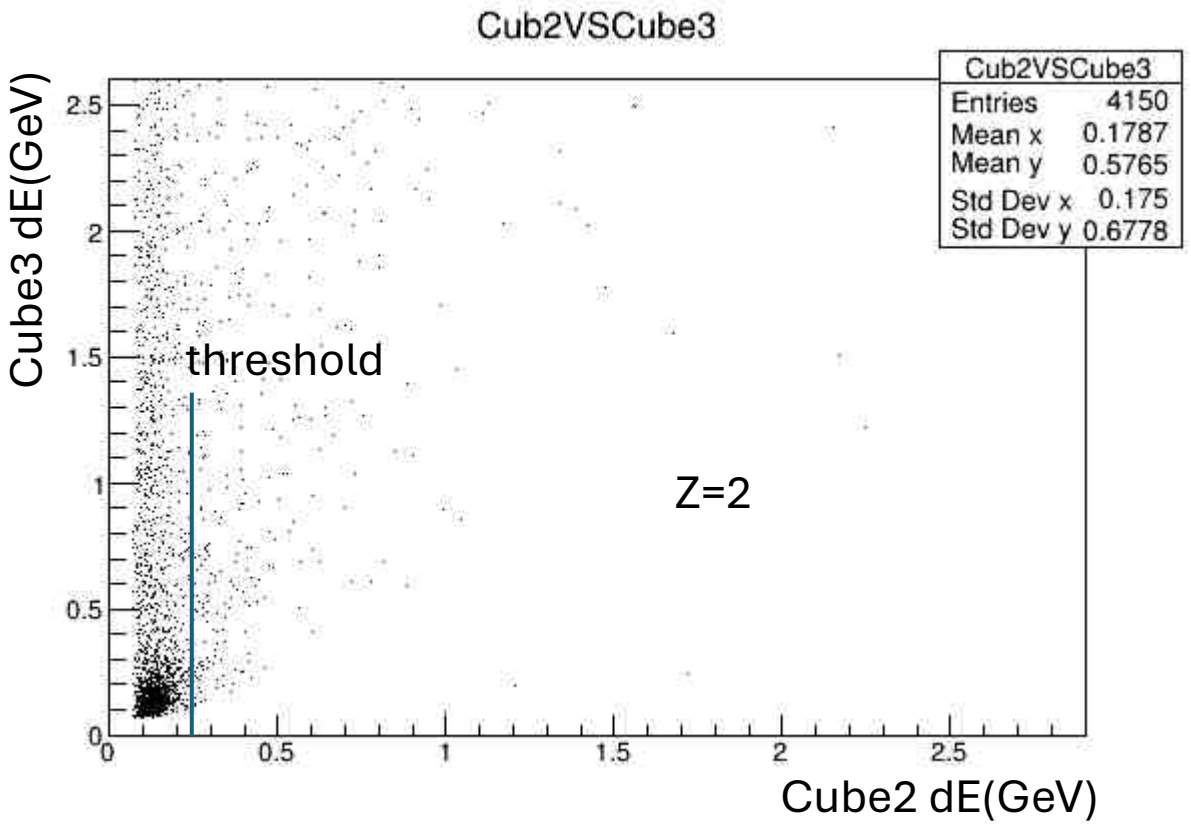
the asimmetry (cube2 cube3) is due to interactions

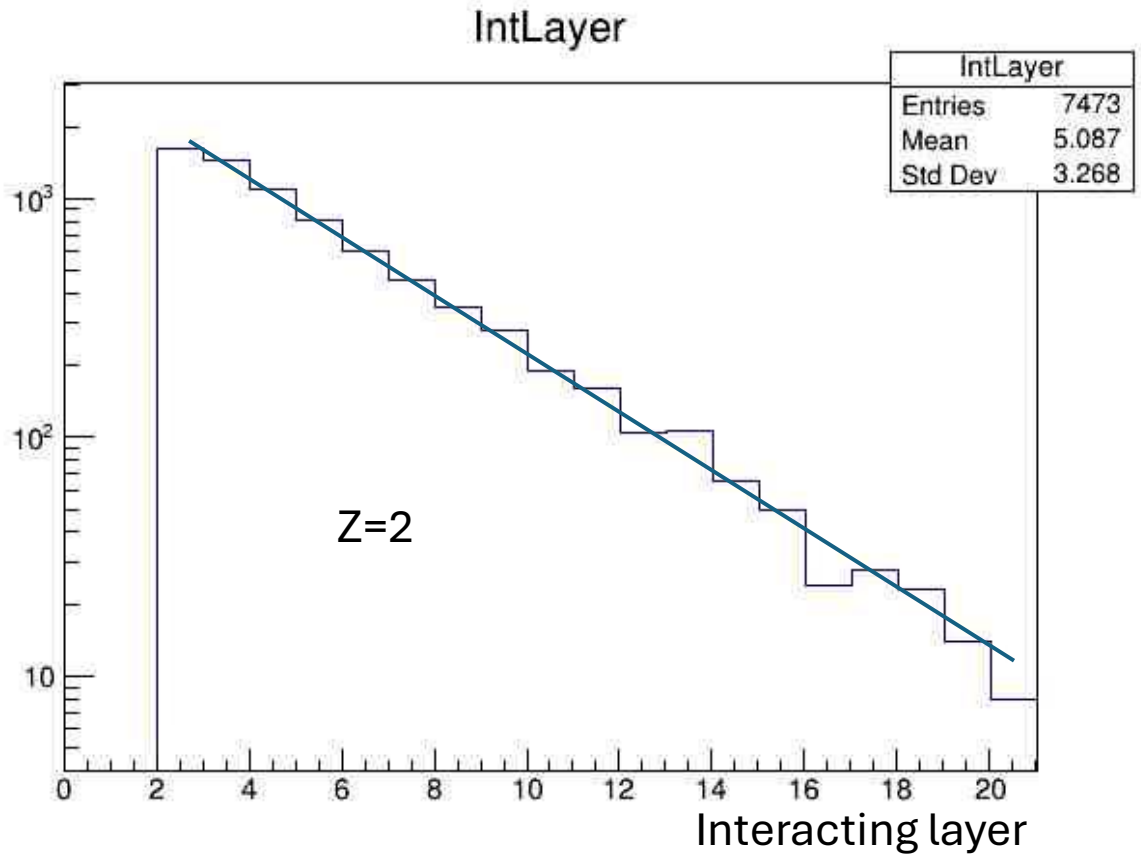




The threshold value for each nucleus is determined looking at the signals itself, being above the «ionization blob» and being the one that produce the best compliance to the expected exponential HISTOGRAM of «Interacting layer» frequency

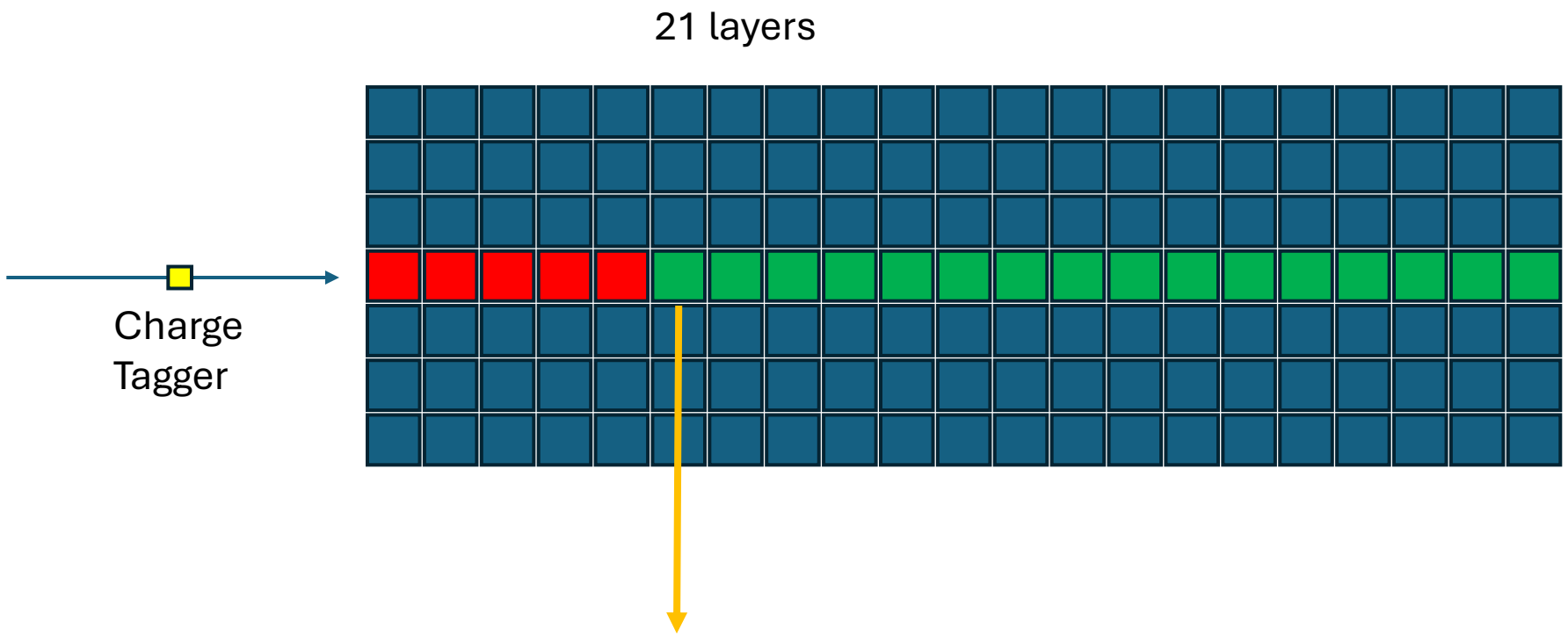
The «Interacting» cube is identified looking at the first cube along beam with signal above threshold , asking also to exhibit a stronger signal in the successive layer (starting from the second layer)

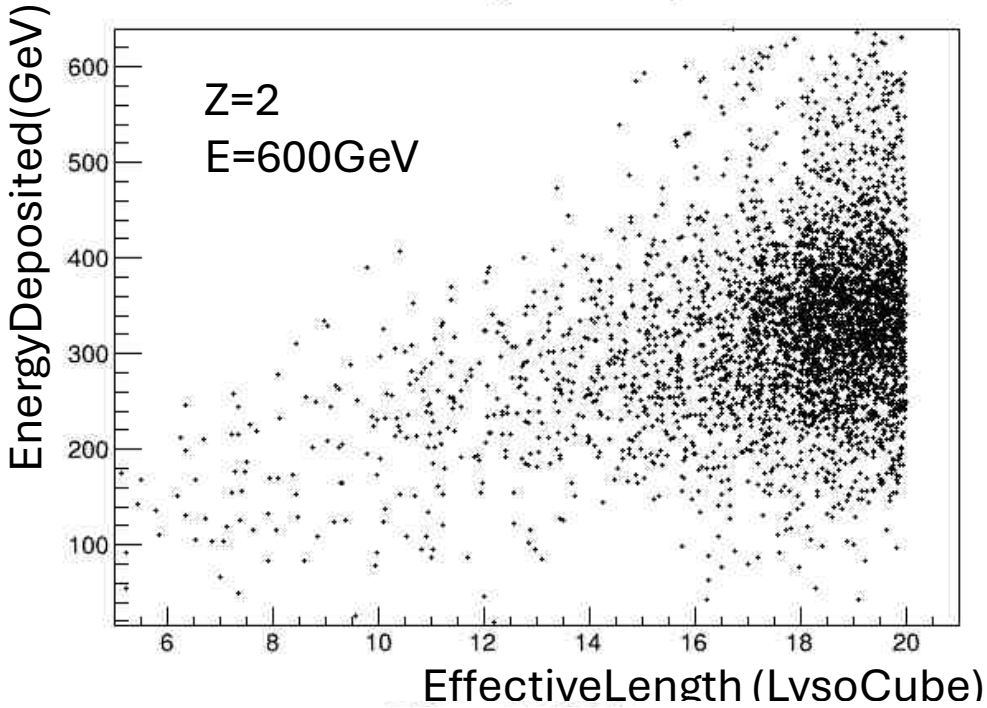


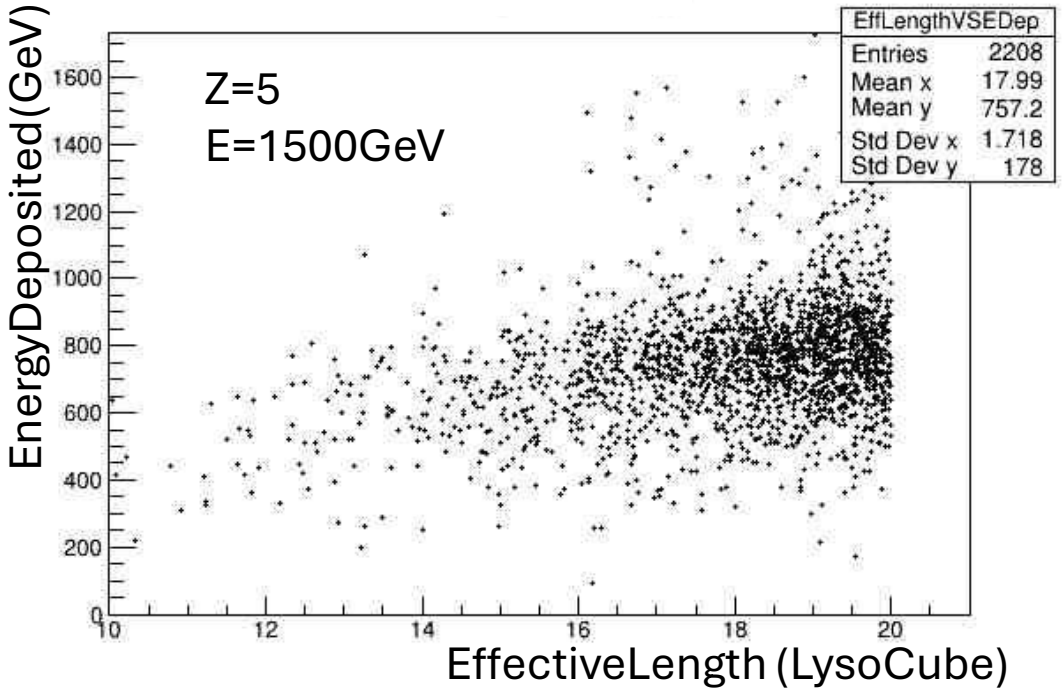


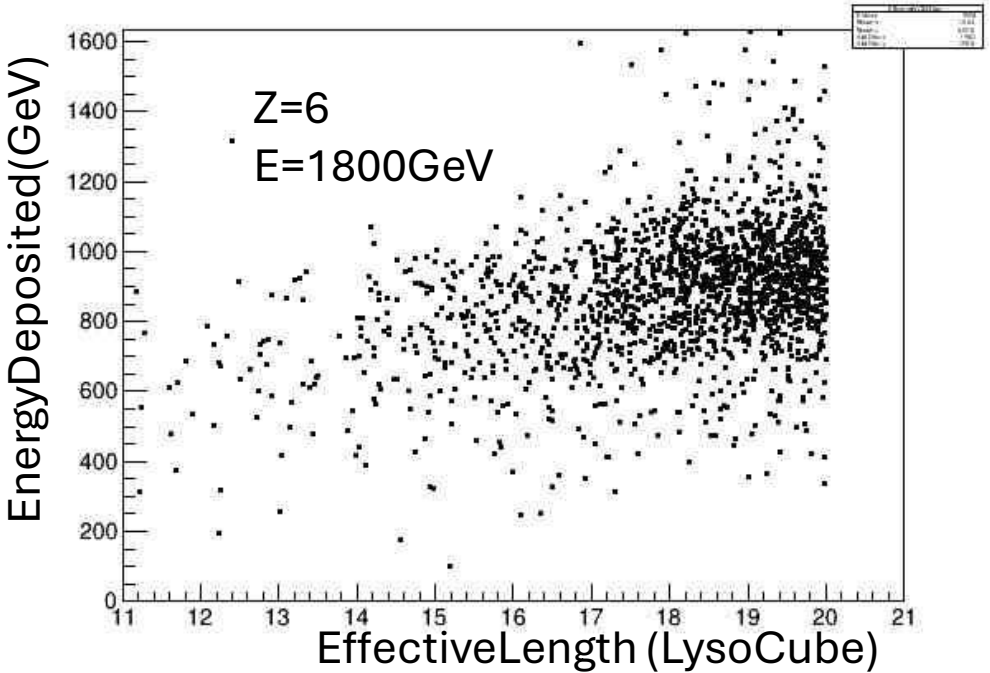
The «EFFECTIVE LENGTH»

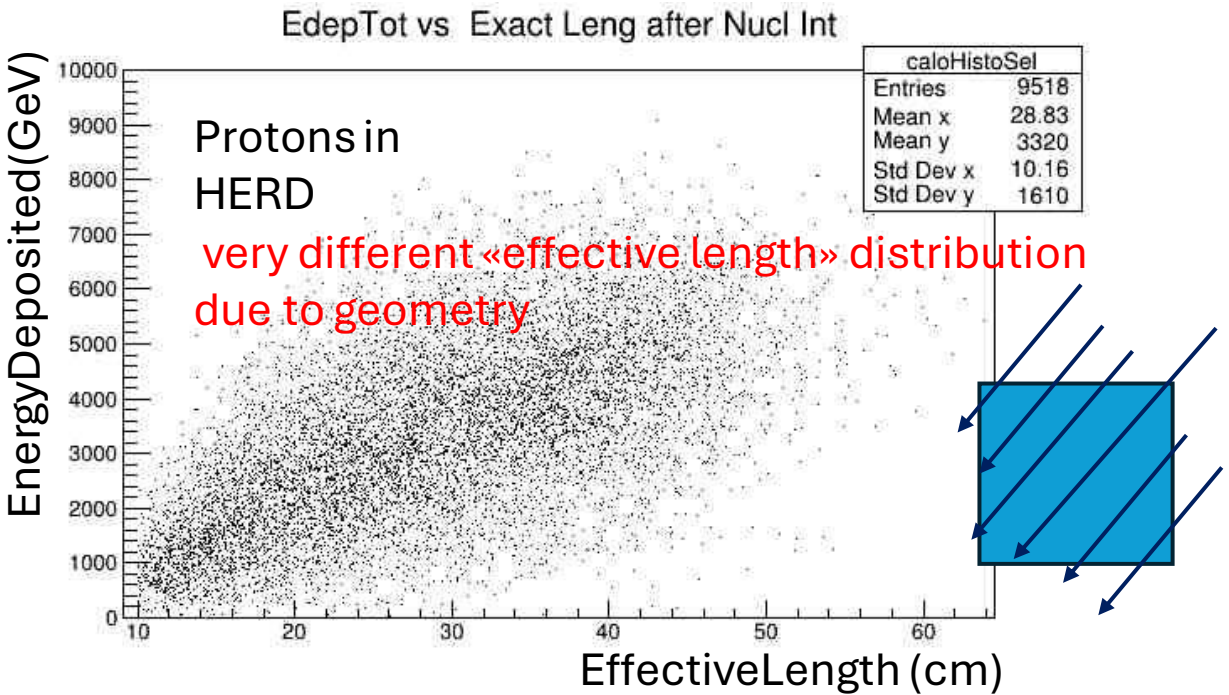
The number of Lyso cube along the beam from the «interacting cube» to the end

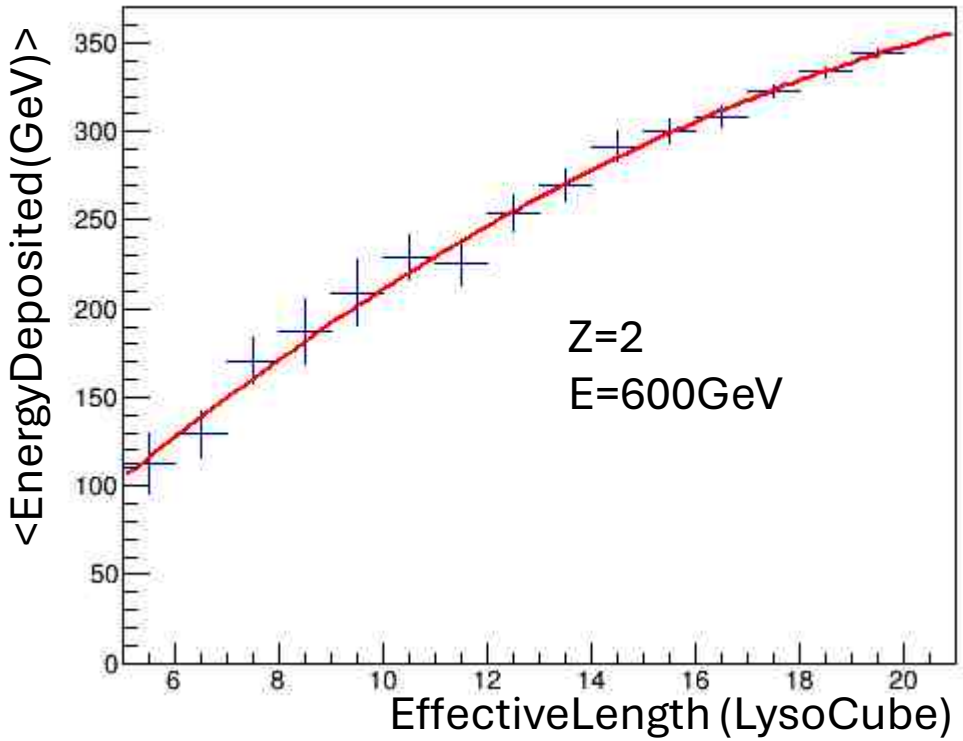


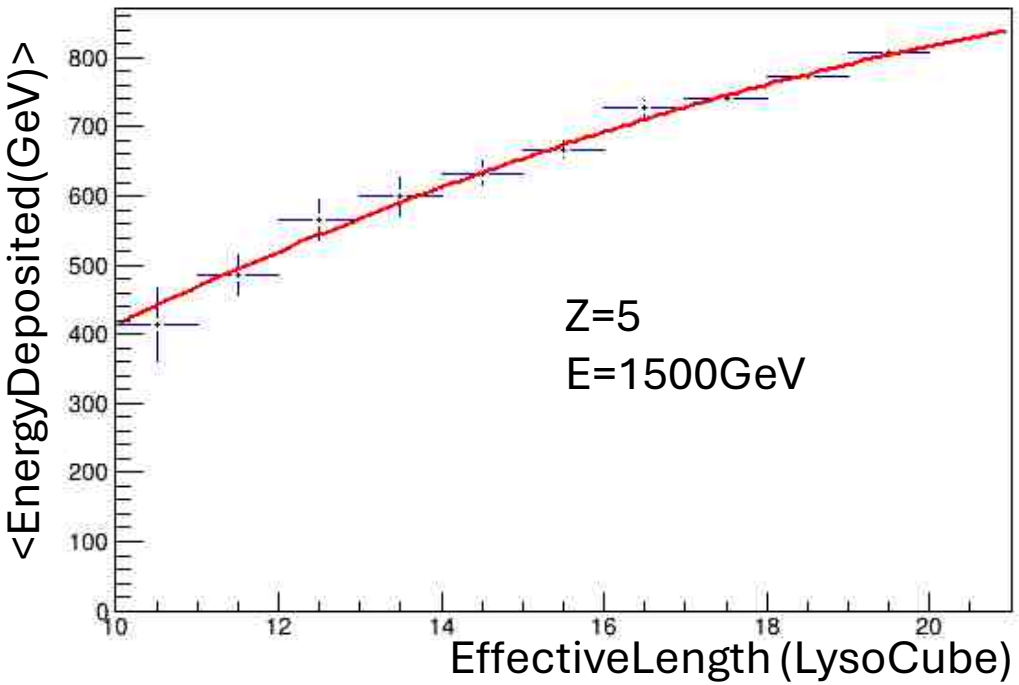

Z=2
E=600GeV
EnergyDeposited(GeV)
EffectiveLength (LysoCube)

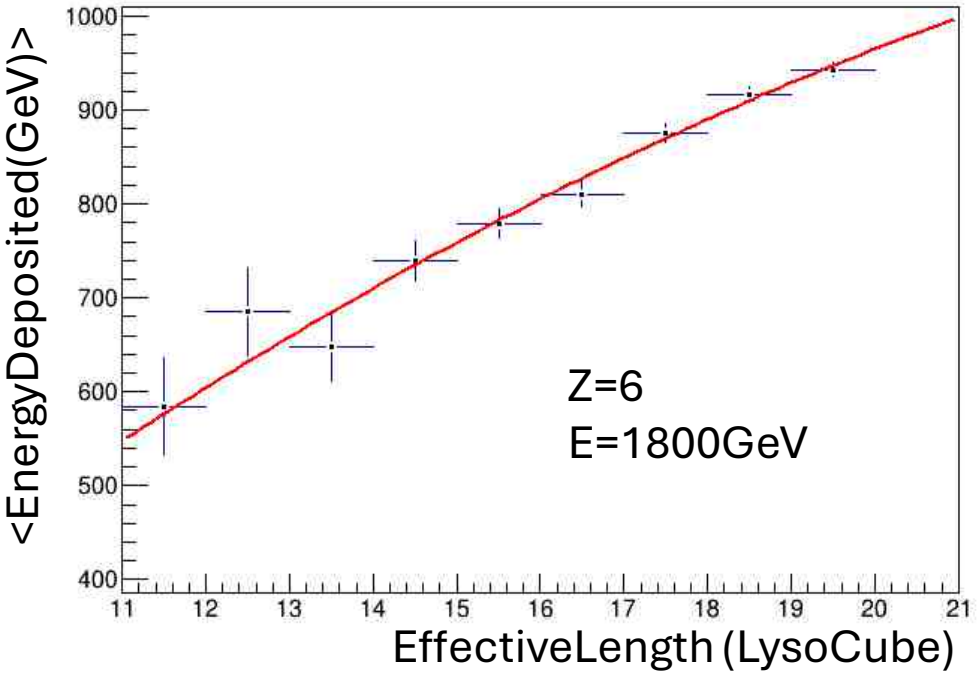

Z=5
E=1500GeV
EffLengthVSEDep
Entries 2208
Mean x 17.99
Mean y 757.2
Std Dev x 1.718
Std Dev y 178
EnergyDeposited(GeV)
EffectiveLength (LysoCube)


Z=6
E=1800GeV
EnergyDeposited(GeV)
EffectiveLength (LysoCube)

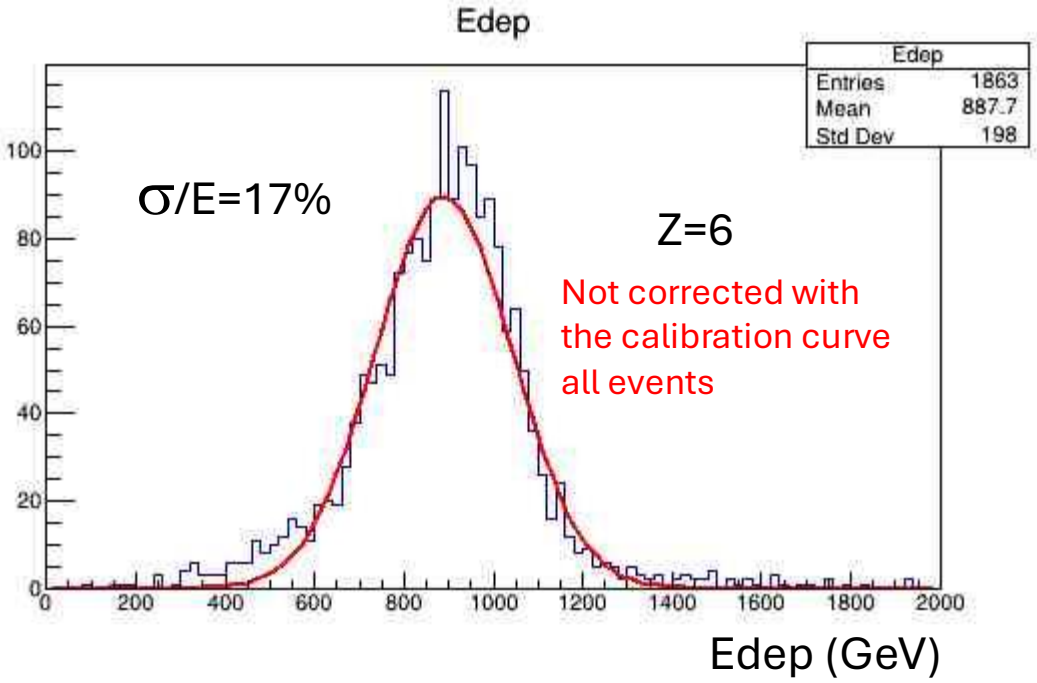

EdepTot vs Exact Leng after Nucl Int
caloHistoSel
Entries 9518
Mean x 28.83
Mean y 3320
Std Dev x 10.16
Std Dev y 1610
Protons in HERD
very different «effective length» distribution due to geometry
EnergyDeposited(GeV)
EffectiveLength (cm)

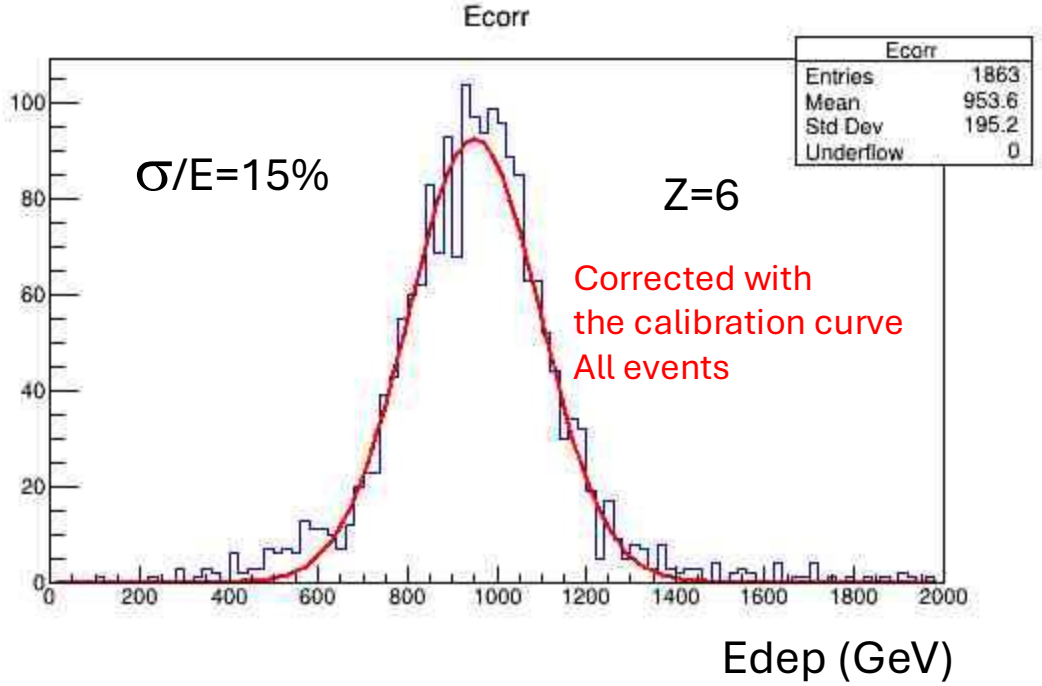


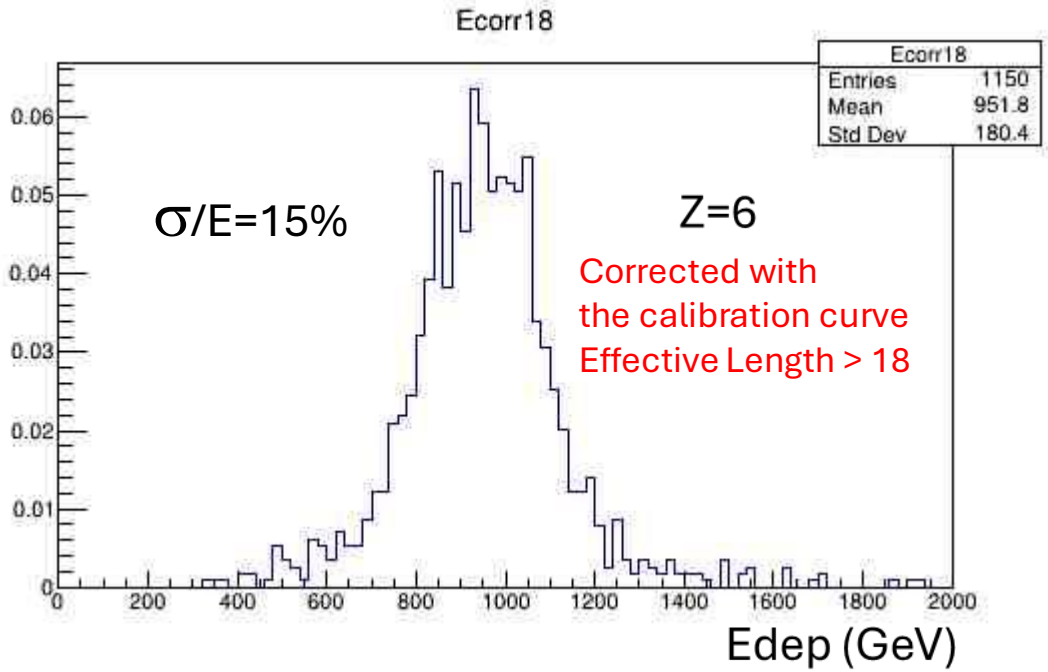


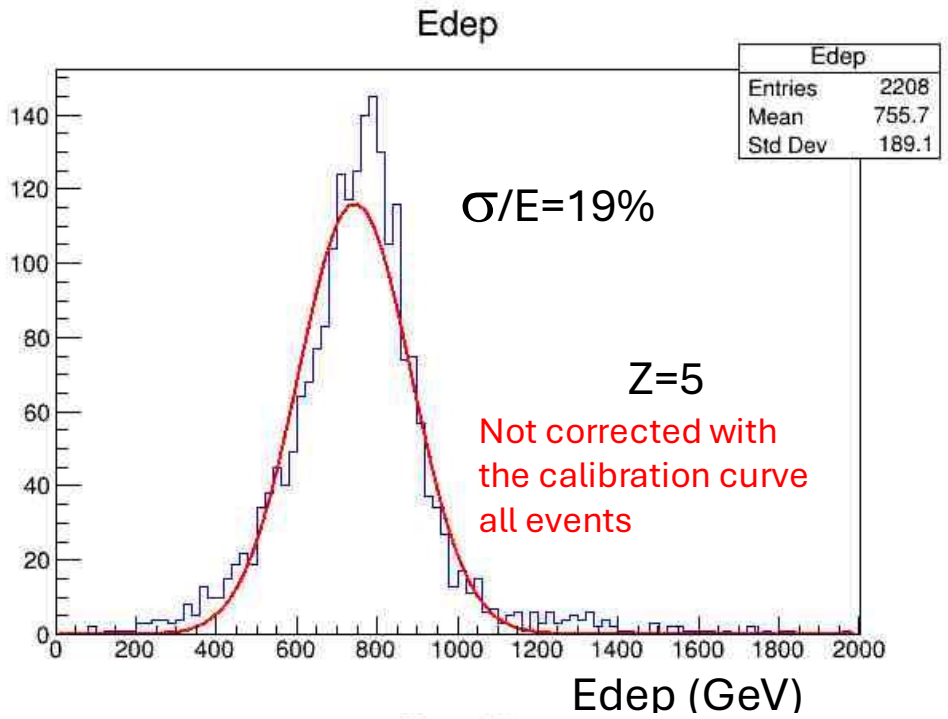


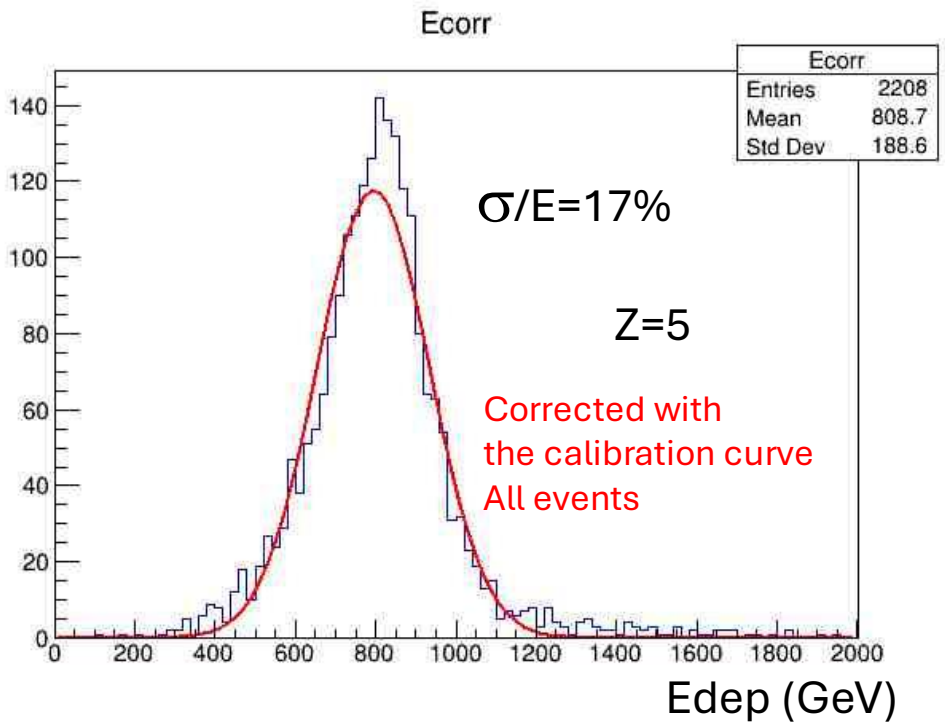
«CALIBRATION CURVES»

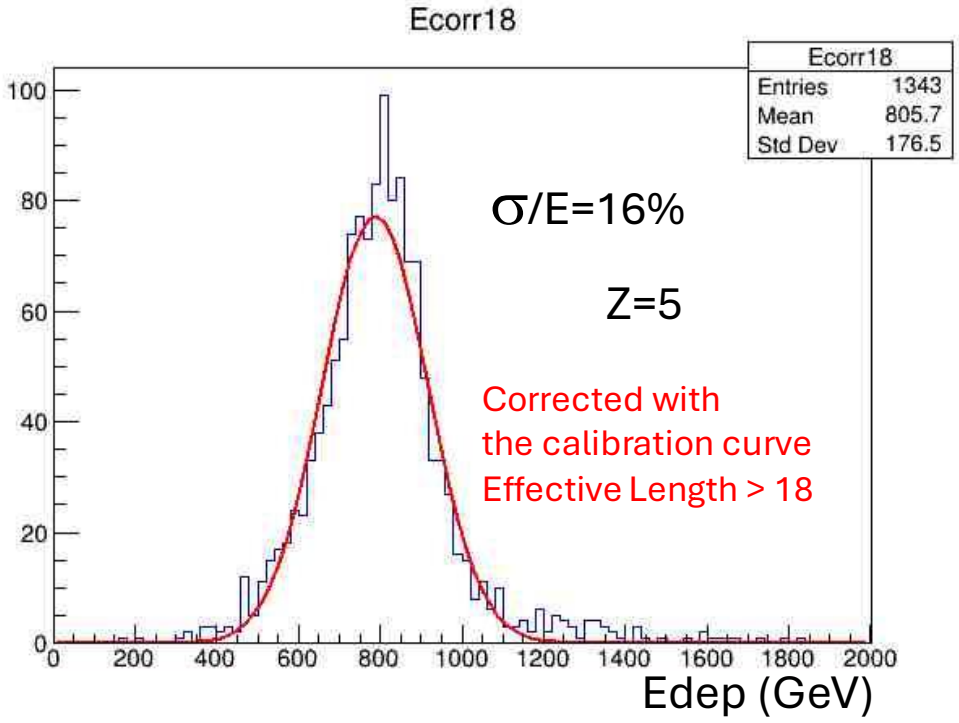

Edep
Edep
Entries 1863
Mean 887.7
Std Dev 198
σ/E=17%
Z=6
Not corrected with
the calibration curve
all events
Edep (GeV)

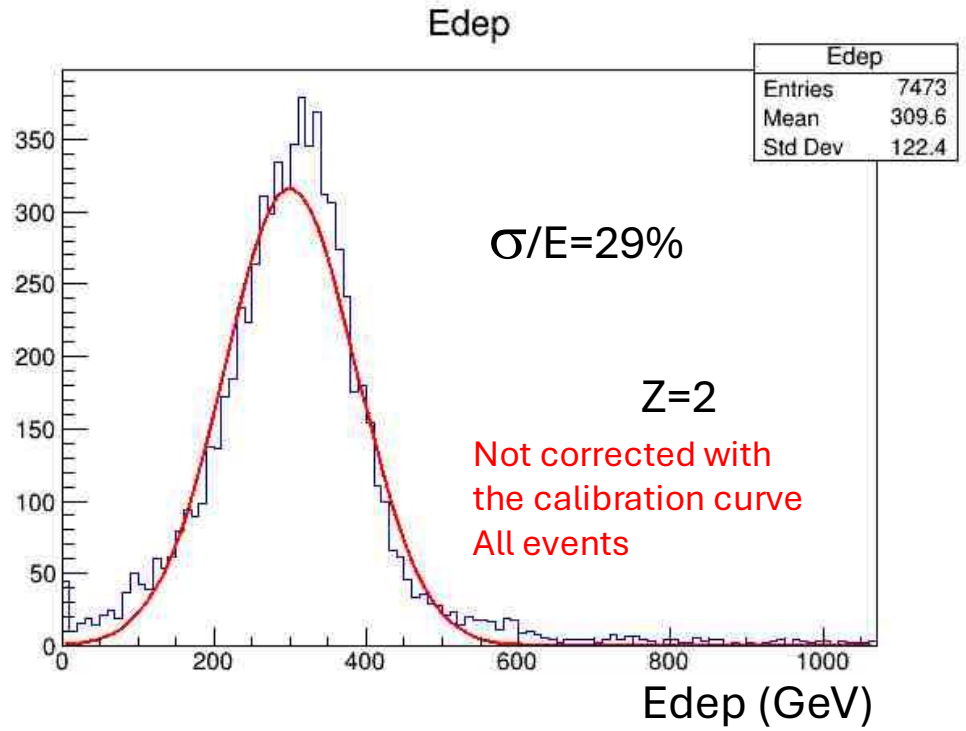

Ecorr
Ecorr
Entries 1863
Mean 953.6
Std Dev 195.2
Underflow 0
σ/E=15%
Z=6
Corrected with
the calibration curve
All events
Edep (GeV)

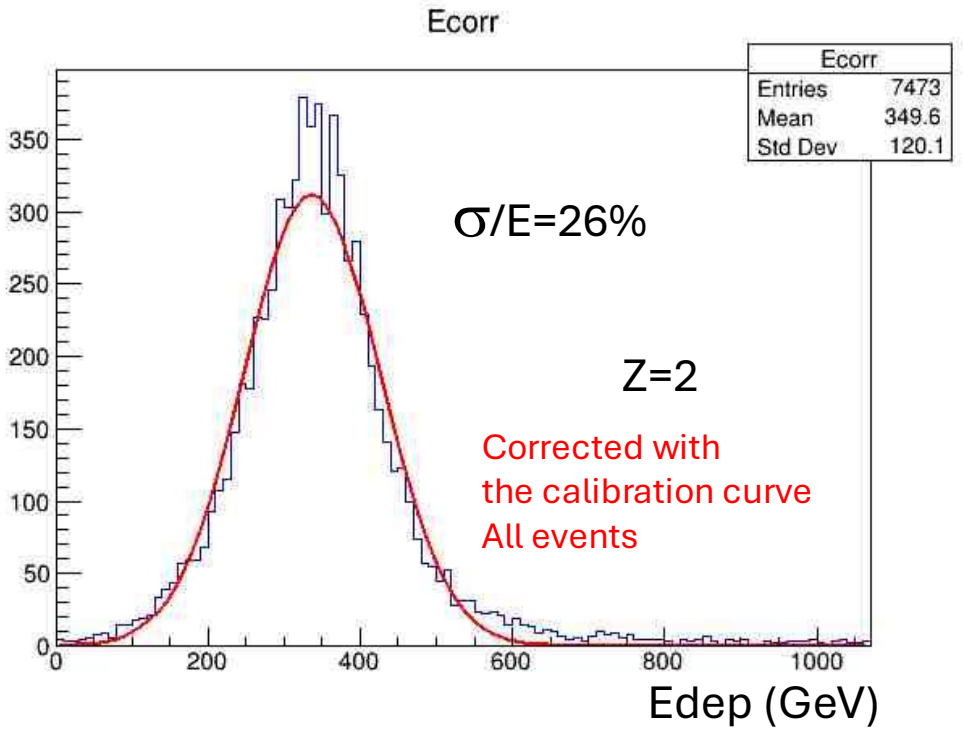

Ecorr18
Ecorr18
Entries 1150
Mean 951.8
Std Dev 180.4
σ/E=15%
Z=6
Corrected with
the calibration curve
Effective Length > 18
Edep (GeV)

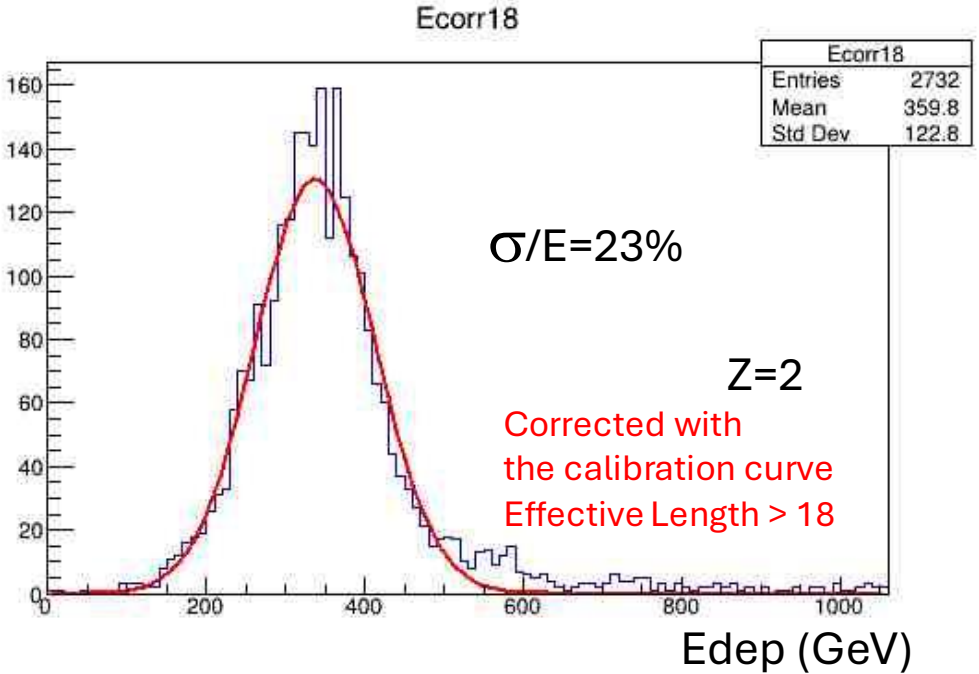

Edep
Edep
Entries 2208
Mean 755.7
Std Dev 189.1
σ/E=19%
Z=5
Not corrected with
the calibration curve
all events
Edep (GeV)


Ecorr
Ecorr
Entries 2208
Mean 808.7
Std Dev 188.6
σ/E=17%
Z=5
Corrected with
the calibration curve
All events
Edep (GeV)


Ecorr18
Ecorr18
Entries 1343
Mean 805.7
Std Dev 176.5
σ/E=16%
Z=5
Corrected with
the calibration curve
Effective Length > 18
Edep (GeV)


Edep
Edep
Entries 7473
Mean 309.6
Std Dev 122.4
σ/E=29%
Z=2
Not corrected with
the calibration curve
All events
Edep (GeV)


Ecorr
Ecorr
Entries 7473
Mean 349.6
Std Dev 120.1
σ/E=26%
Z=2
Corrected with
the calibration curve
All events
Edep (GeV)


Ecorr18
Ecorr18
Entries 2732
Mean 359.8
Std Dev 122.8
σ/E=23%
Z=2
Corrected with
the calibration curve
Effective Length > 18
Edep (GeV)