Simulations of single electrons
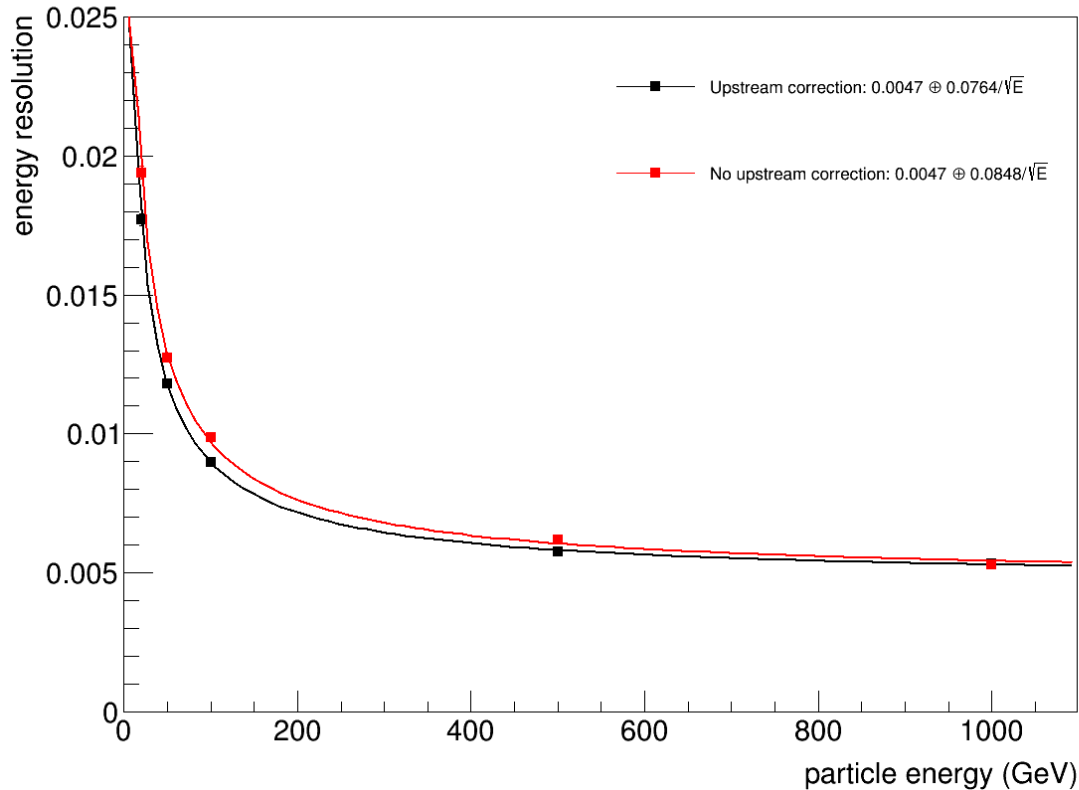
- "Sunny" ECAL + tiles HCAL

  - Upstream material 1.2 X0

- Single electrons at eta = 0

  - Energy 20, 50, 100, 500, 1000 GeV

- Reconstruction

  - Without noise

  - With upstream energy correction

  - Sliding window reconstruction (ECAL + HCAL) → energy resolution
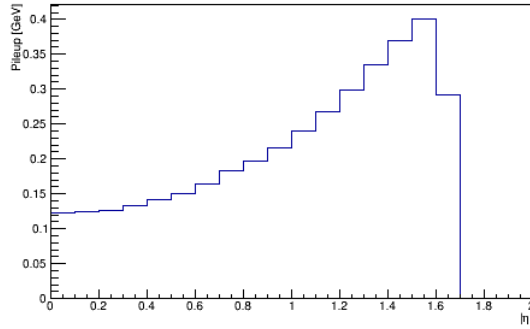
Energy resolution

Electrons SW, $1.2X_0$, B= 4T

- Simulations only (Anna)
    - correction: 0.0066 + 0.075 / sqrt(E)
    - no correction: 0.0075 + 0.0875 / sqrt(E)

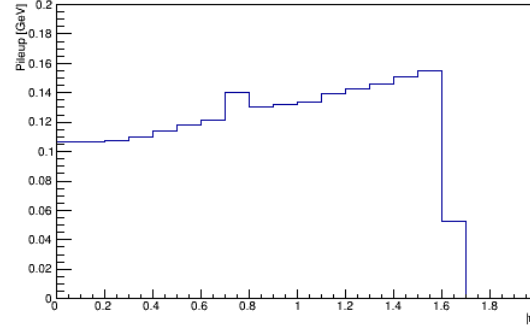# Estimation of pile-up

- Tracker + "Sunny" ECAL + tiles HCAL

- Minimum bias events simulated with Pythia8
    - 1 per event
    - Statistics: 500,000 events

- Pile-up noise estimation
    - Scaled to <mu> = 1000 (factor sqrt(1000))
    - Out-of-time pile-up correction 1.6
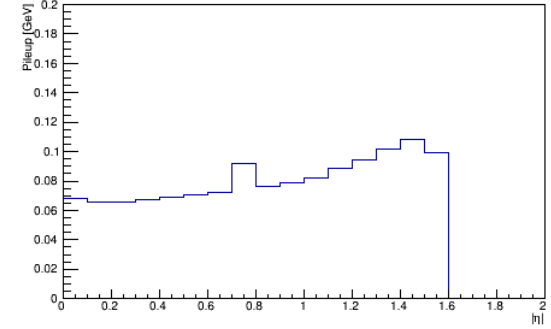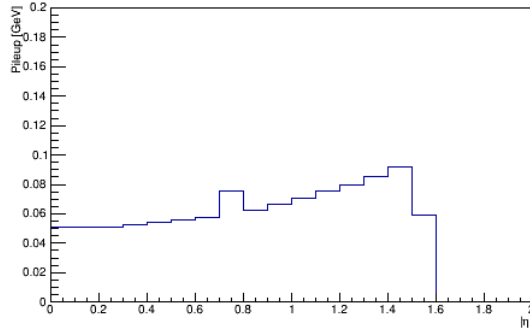   - Done for ECAL, same to be done for HCAL

Pile-up for "Sunny"
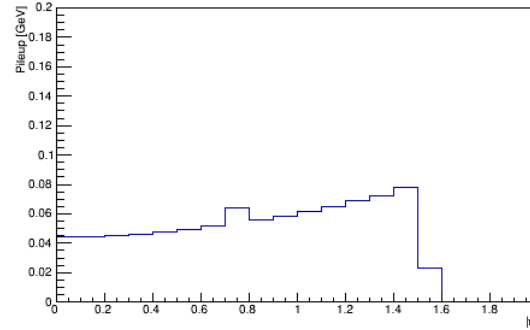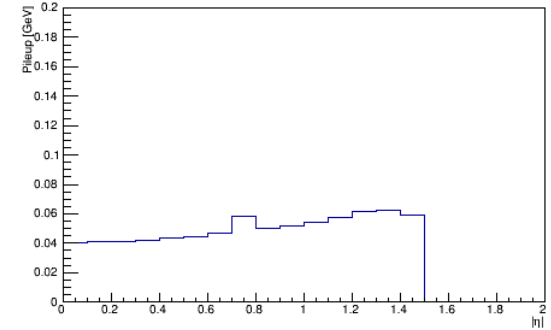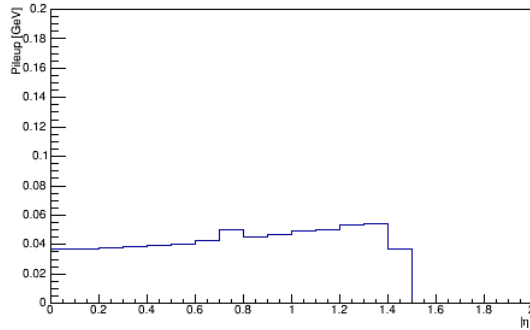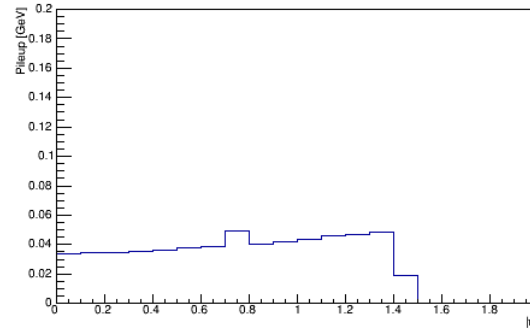
Noise for old ECAL
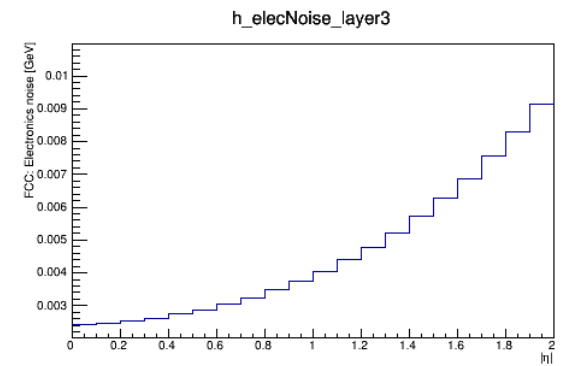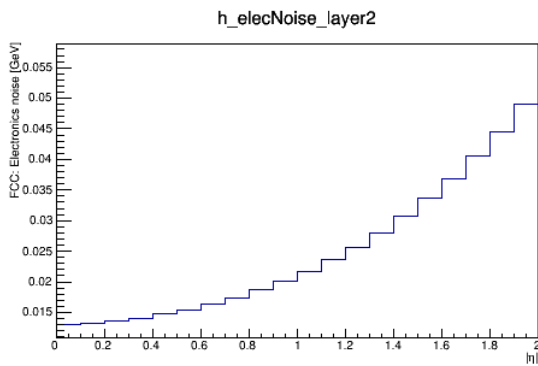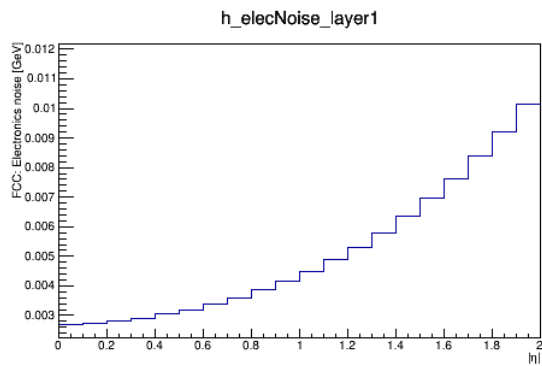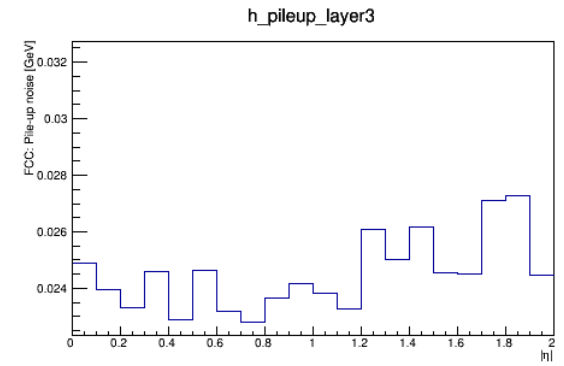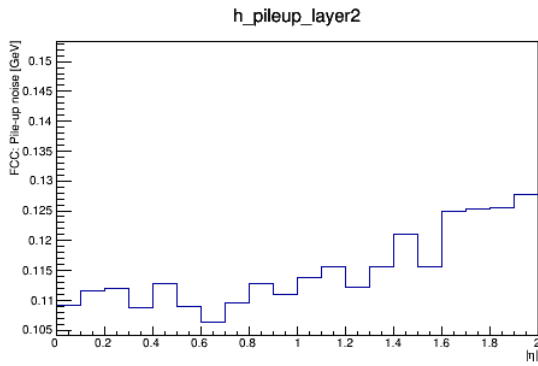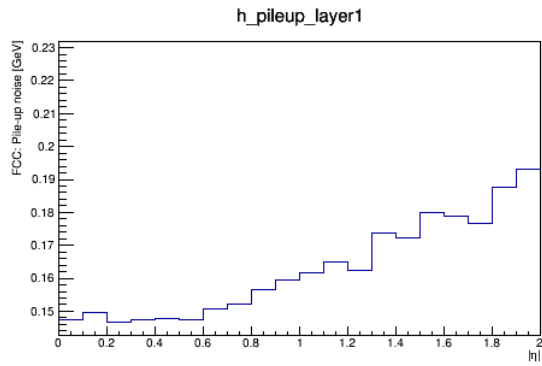
Energy resolution – sim only

electron, B = 4T, inclined ECal 30°, 3mm to 5.4mm lAr, 1mm PCB, 2mm absorber - 1.2 X$_0$ in front, SF(r$_{1..8}$)

e^-, B = 4T: $0.0075 \oplus \frac{0.0875}{\sqrt{E}}$

No upstream correction

electron, B = 4T, inclined ECal 30°, 3mm to 5.4mm lAr, 1mm PCB, 2mm absorber - 1.2 X$_0$ in front, SF(r$_{1..8}$), correction for material in front (8cm first layer)

e^-, B = 4T: $0.0066 \oplus \frac{0.075}{\sqrt{E}}$

Upstream correction