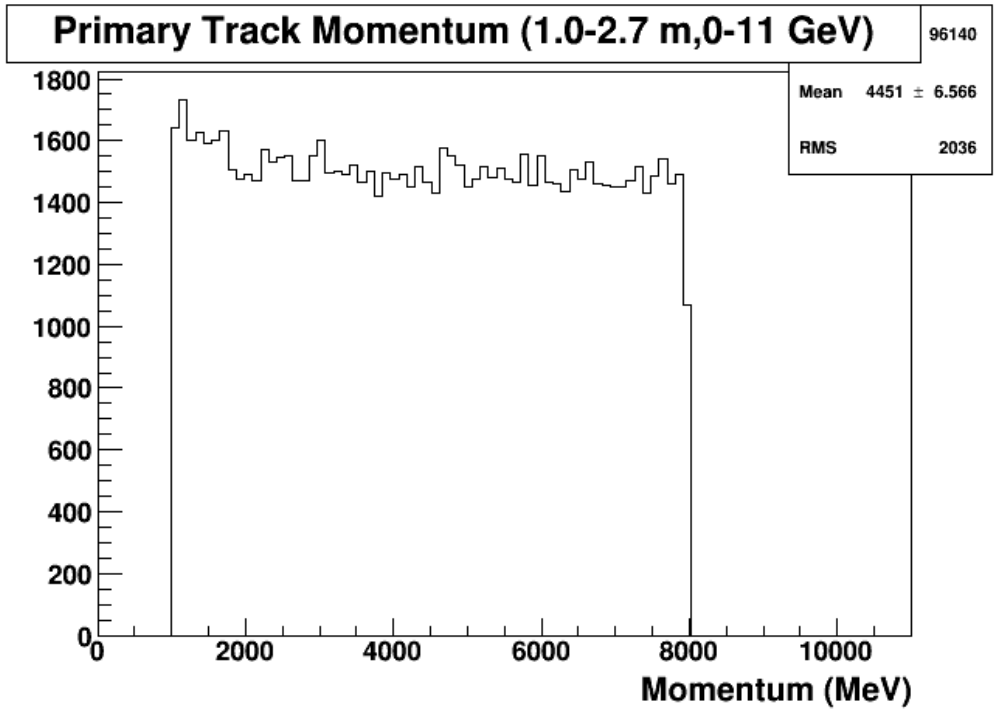
ECAL Clustering Update - 2

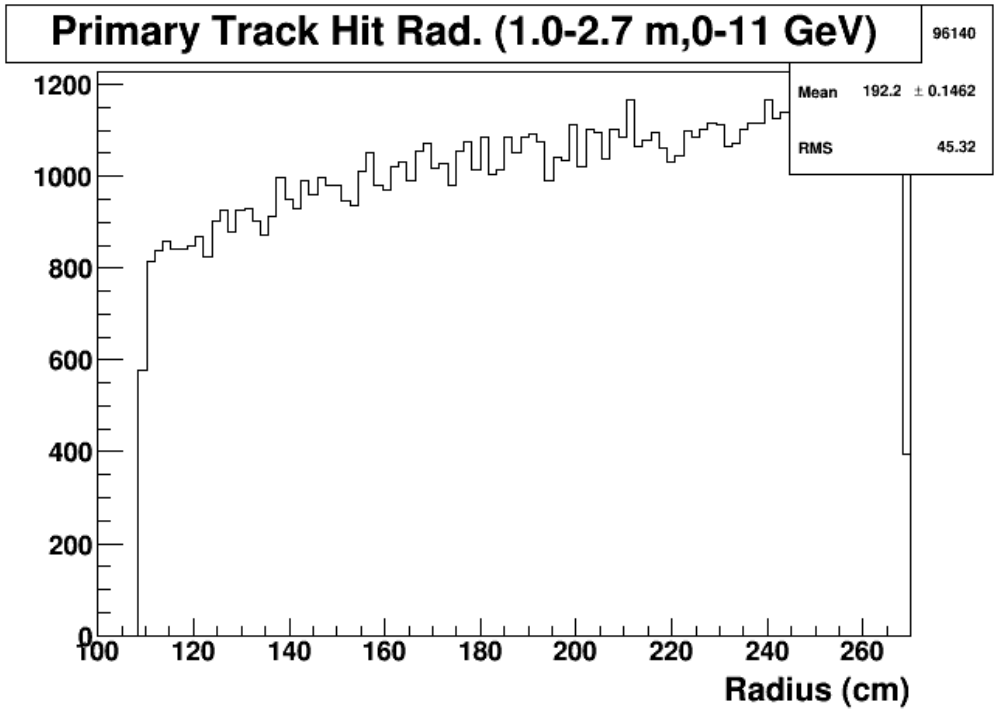
ECAL Simulation Summary

- Input flat distribution : electrons
- No radiative effects in the target
- Setup only include ECAL and sensitive detector replacing last GEM in vacuum medium.
- Use ecal cluster energy and input momentum to get energy resolution for shower only and pre-shower + shower combination

Input Flat Distribution



Input Momentum



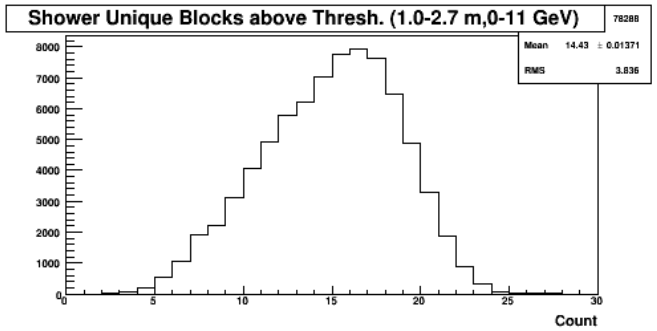
Input Radius

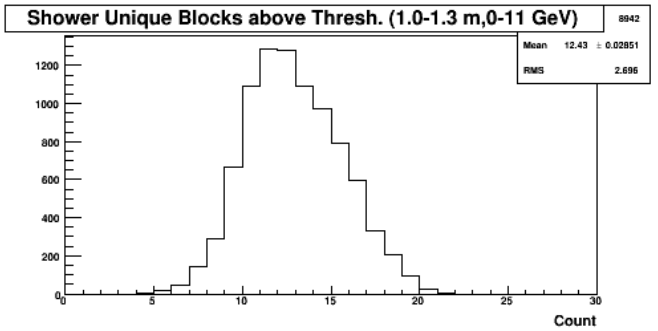
Input Angle range is 20 to 36 deg

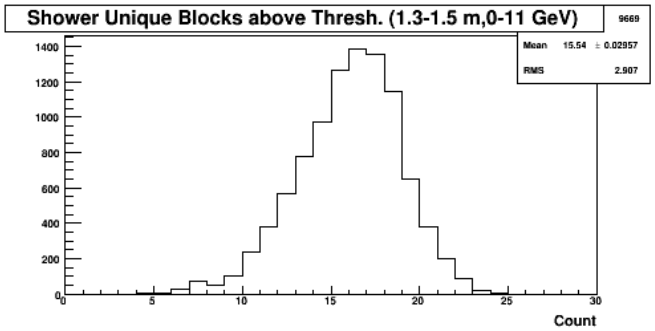
Shower 6+1 Clustering for e^-

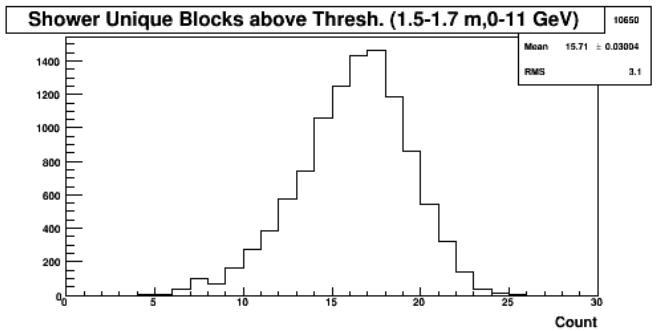
- Selecting all the 6+1 clusters above the threshold
- The threshold is based on DIS tracks energy deposit
  - R range (cm)
    - {110.0 ,130.0 ,150.0 ,170.0 ,190.0 ,210.0 ,230.0 ,250.0}
    - {130.0 ,150.0 ,170.0 ,190.0 ,210.0 ,230.0 ,250.0 ,270.0}
  - DIS Threshold cuts (edep in MeV)
    - {369.4 ,350.0 ,302.1 ,265.4 ,237.5 ,223.0 ,211.3 ,183.5}
- Count all the unique blocks in clusters above threshold cut
  - Select all the 6+1 clusters above DIS threshold
  - Count unique blocks in this subset

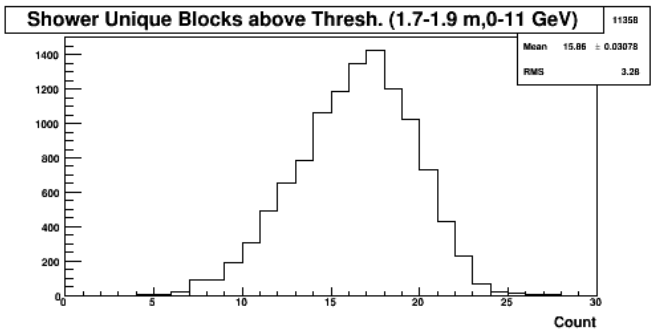
Block Count for Shower 6+1 Clustering for e^-

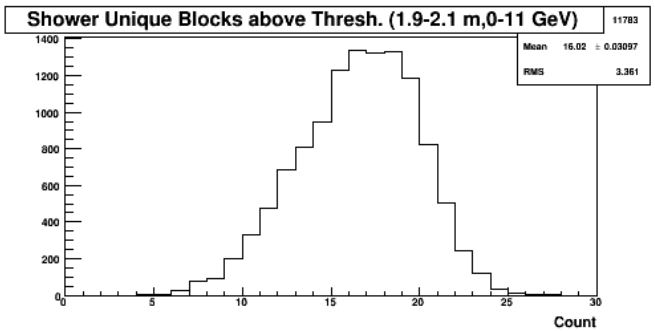


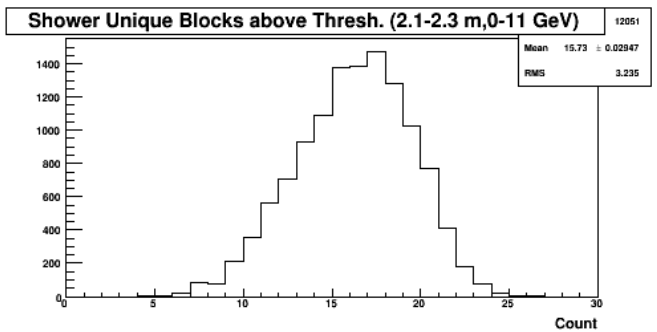


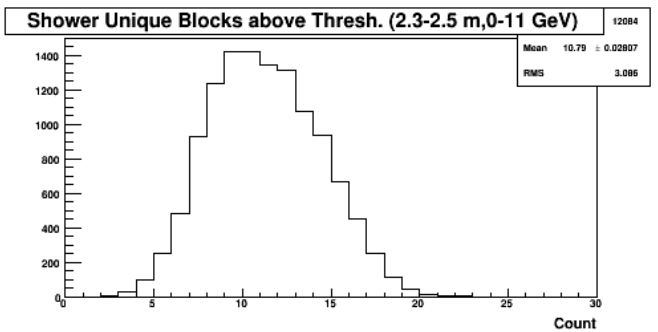


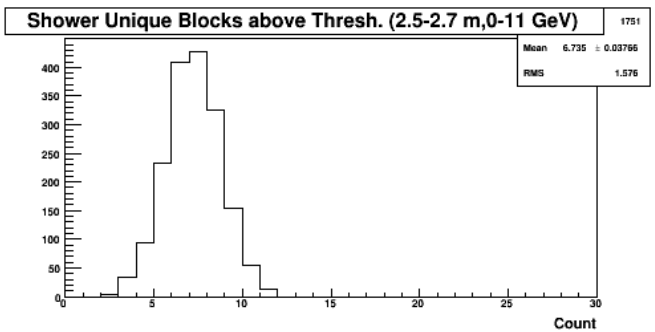




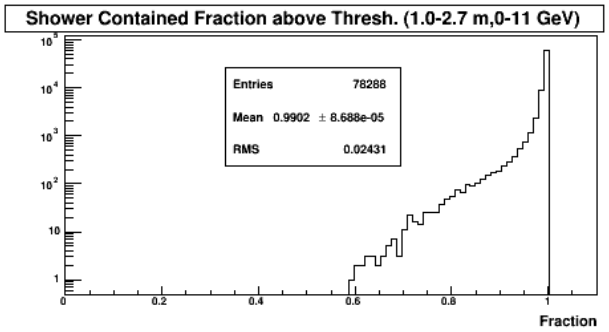


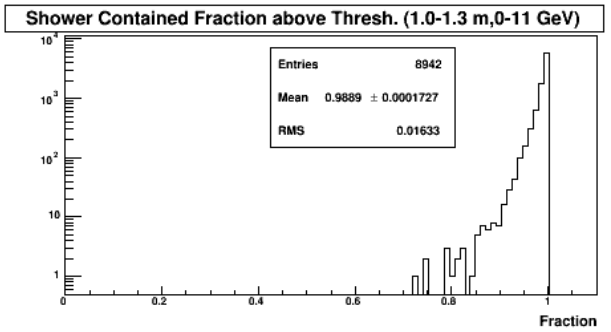


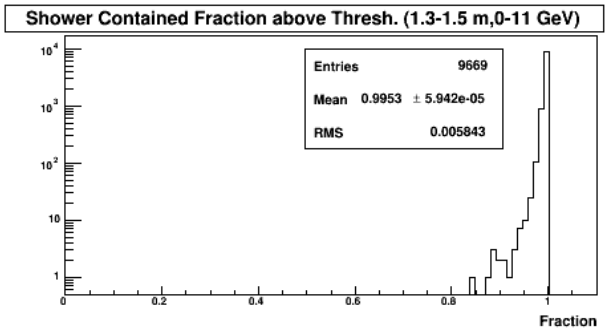


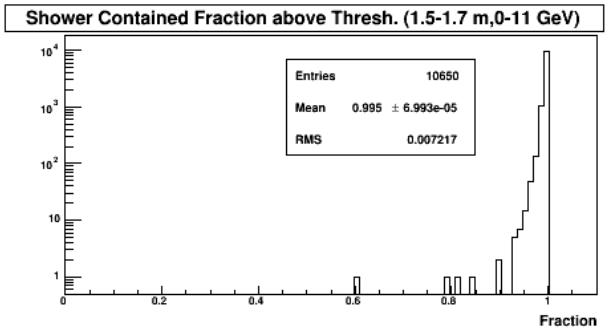


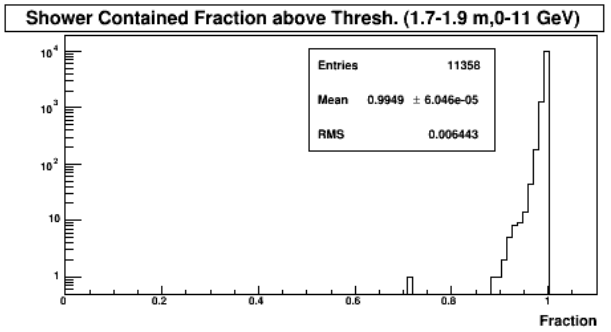
Energy Fraction Contained in blocks above Threshold

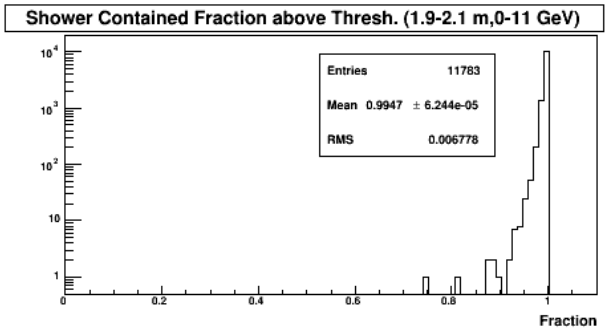


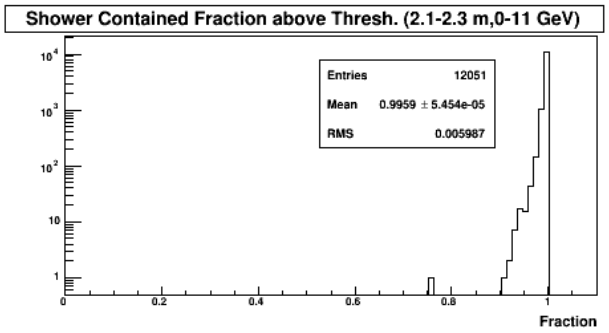


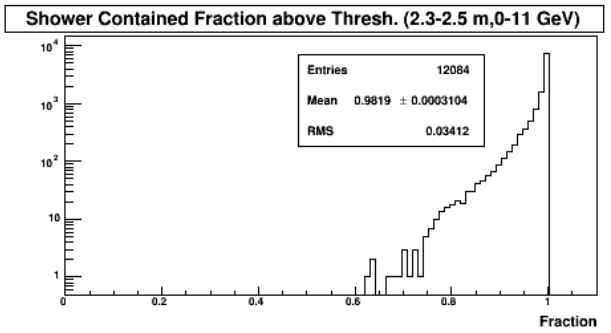


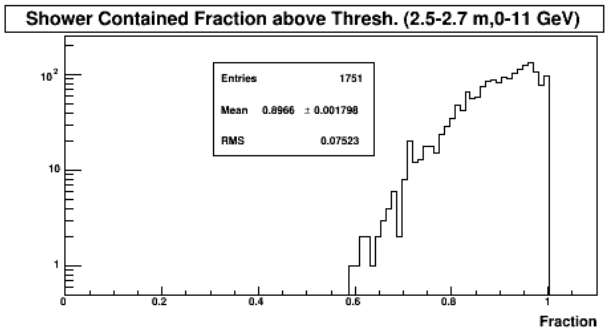








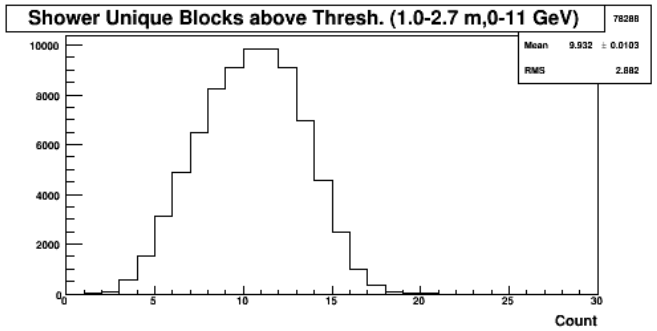


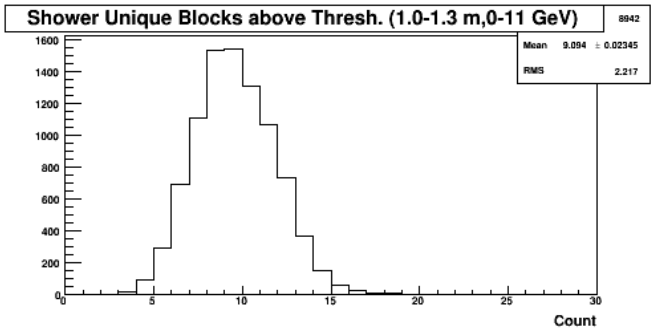


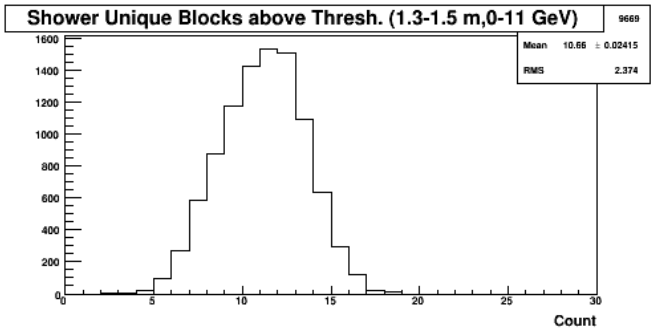
Apply Min. Energy Threshold to Blocks

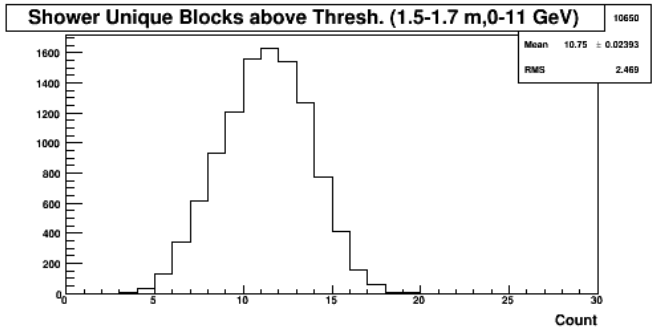
- The unique block count includes blocks with minuscule energy deposits
- Applied a 1 MeV cut to get unique block count
  - Select all the 6+1 clusters above DIS threshold
  - Select unique blocks in this subset
  - Count only blocks with edep>1 MeV

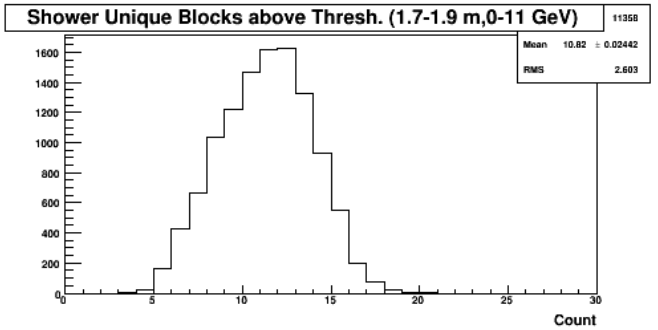
Block Count for Shower 6+1 Clustering for e^- with 1 MeV Cut

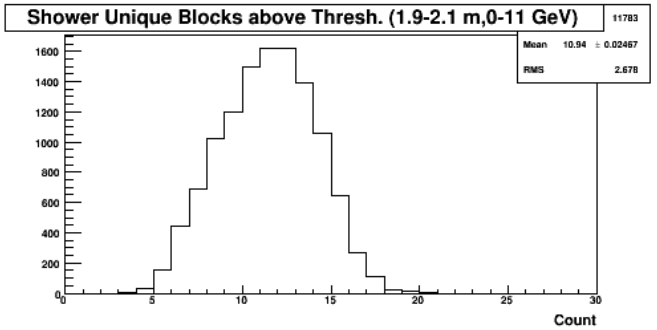


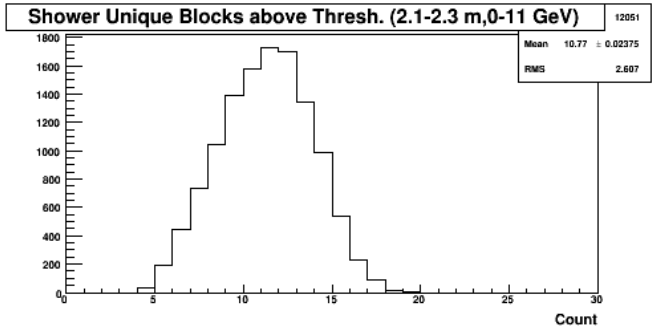


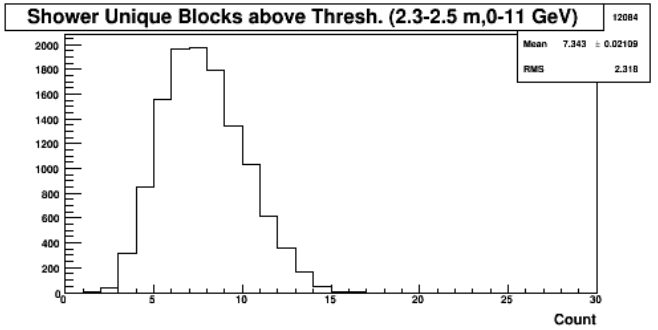


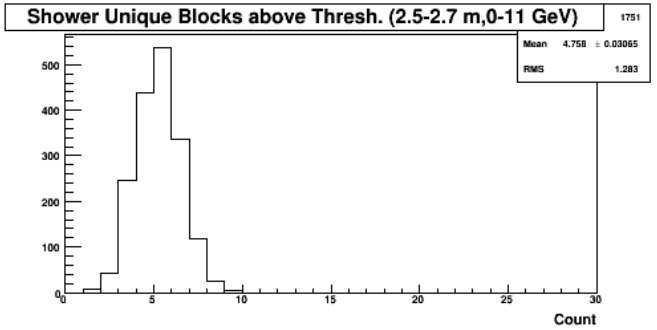




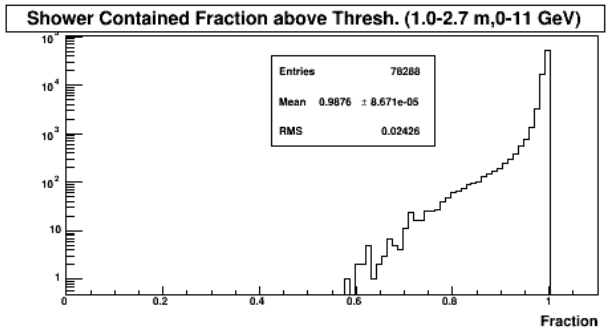


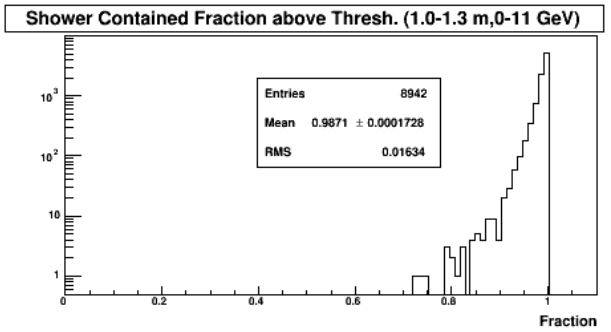


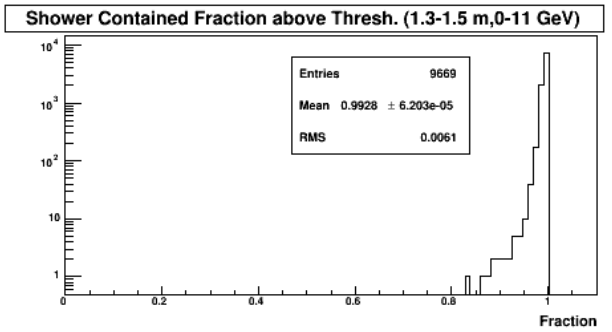


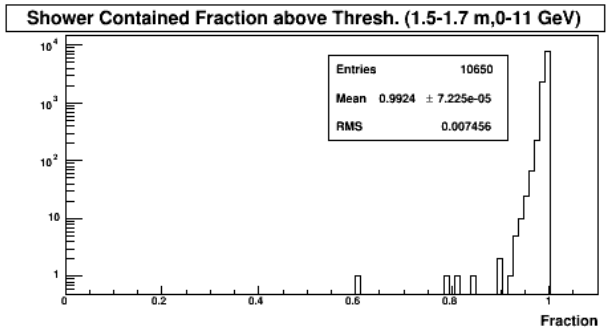


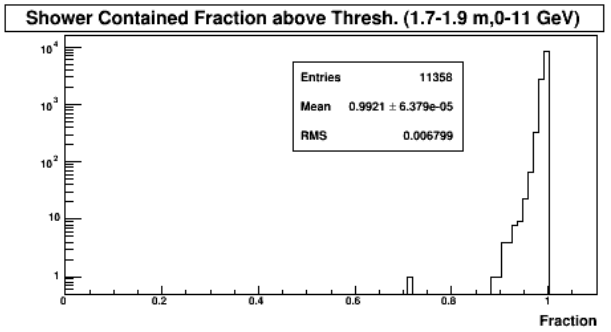
Energy Fraction Contained in blocks above Threshold with 1 MeV Cut

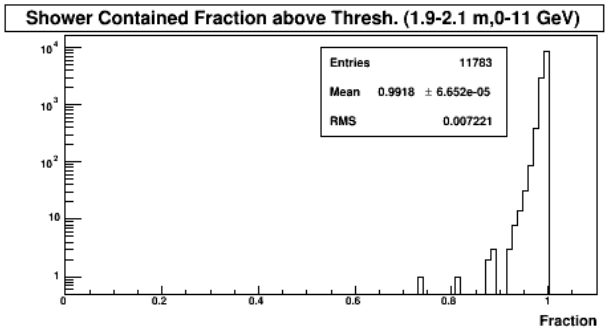


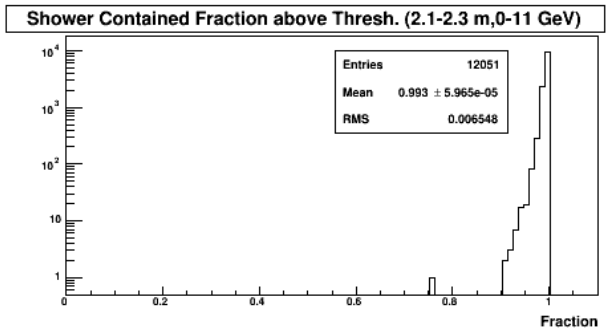


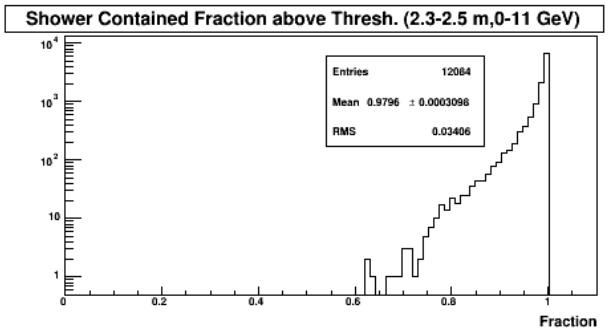


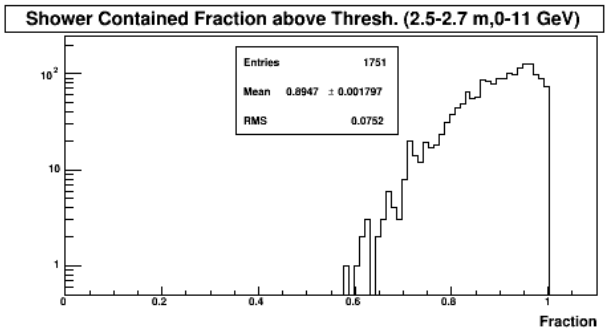




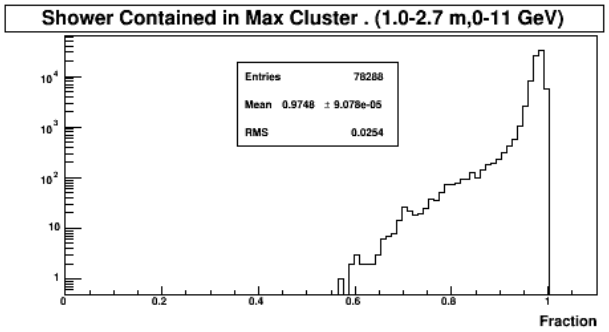


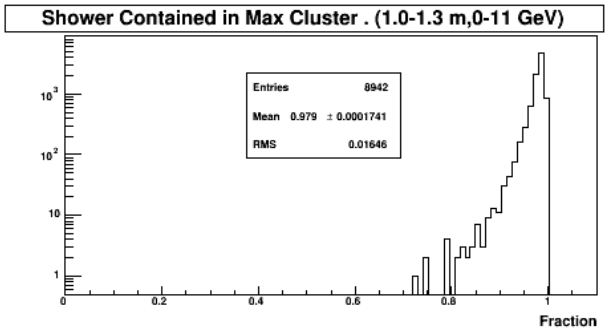


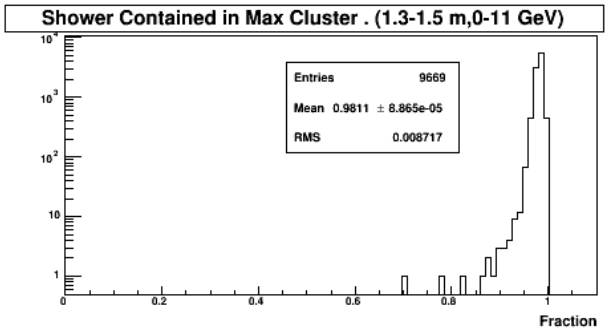


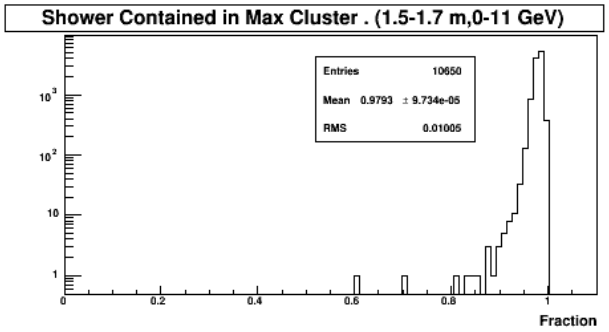


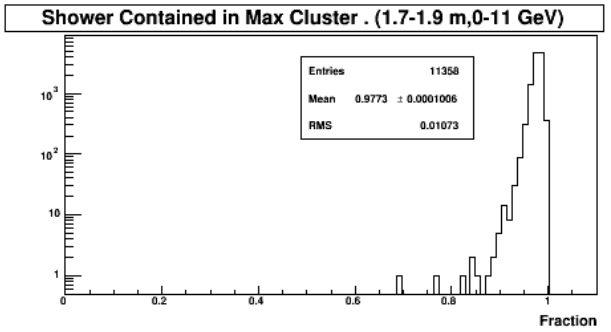
Energy Fraction Contained in Max 6+1 Cluster

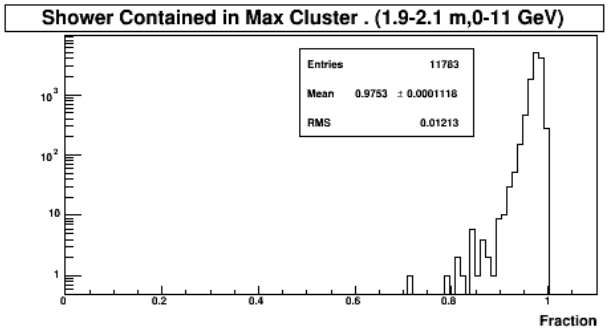


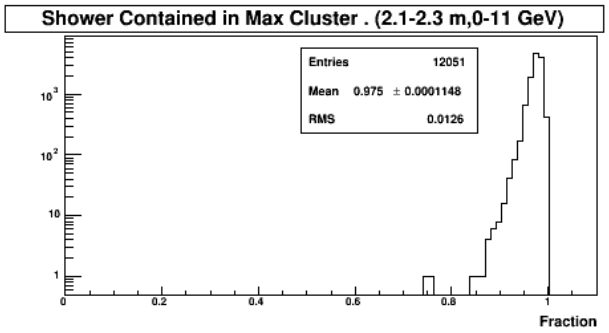


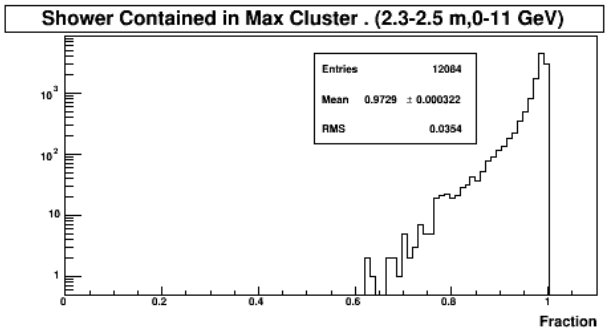


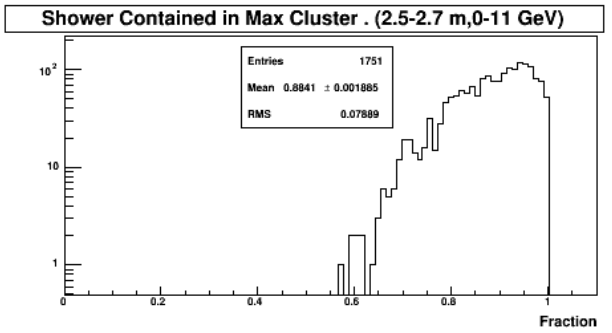




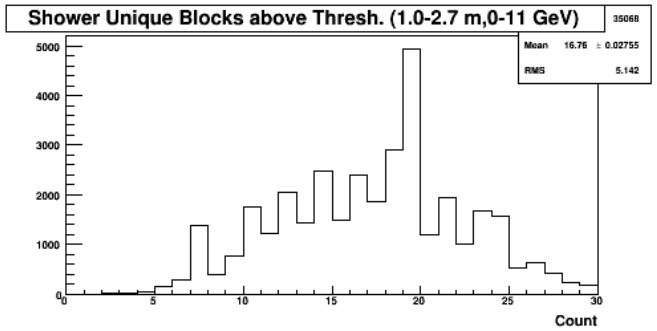


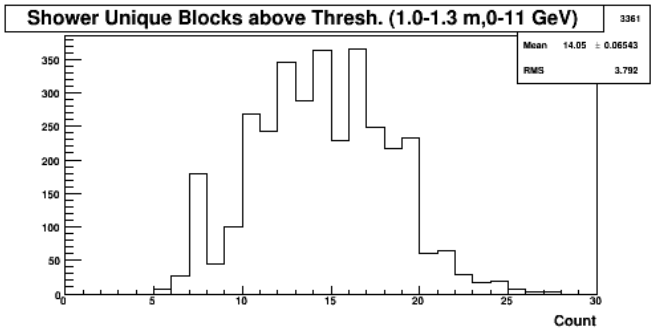


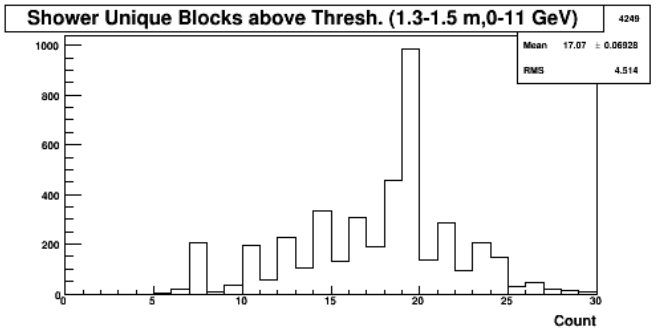


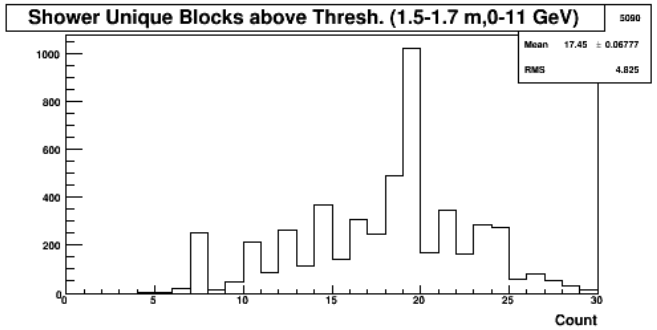


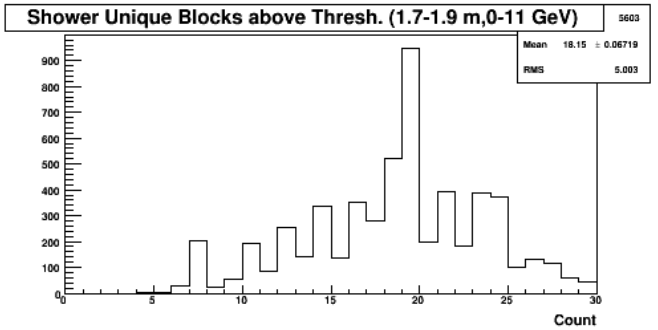
Block Count for Shower 6+1 Clustering for π^-

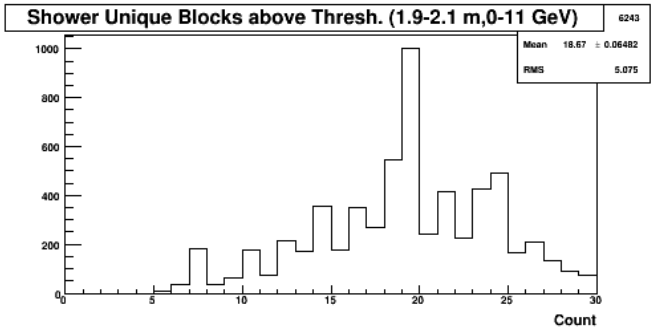


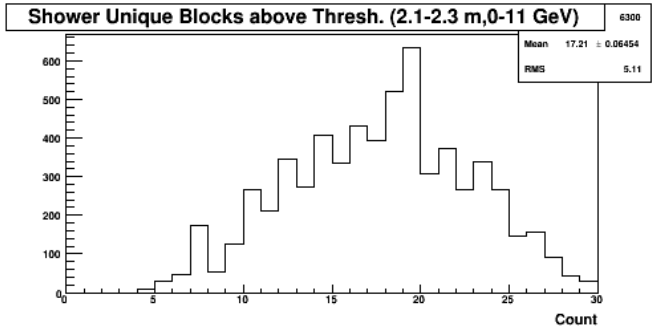


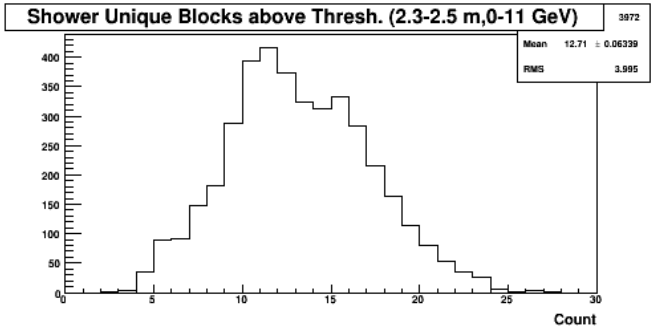


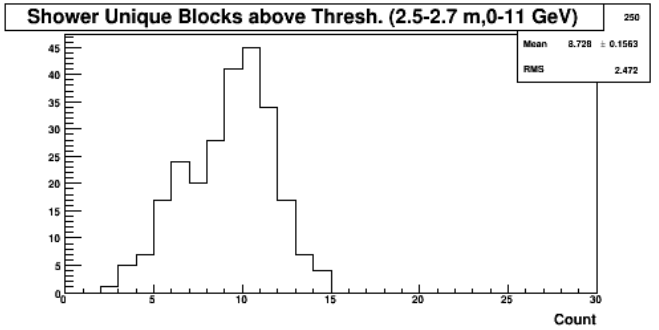




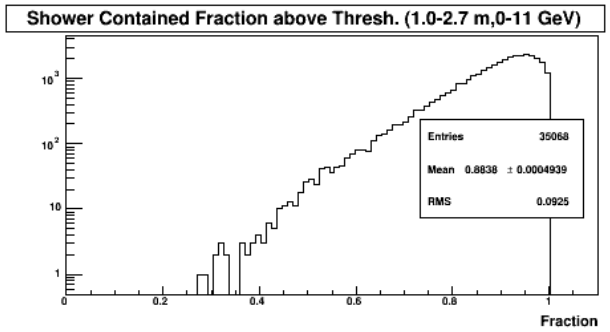


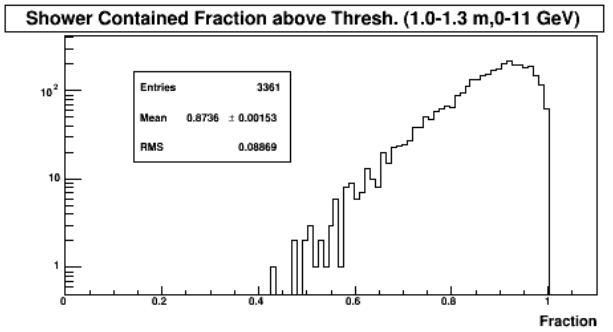


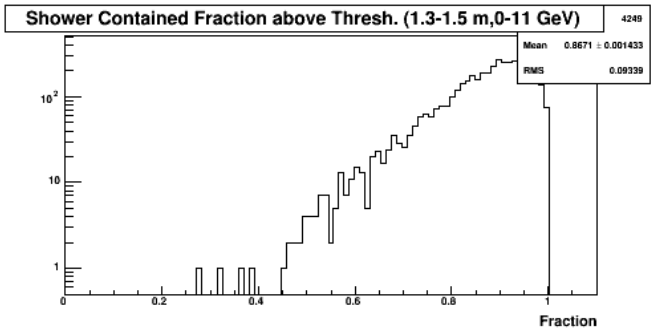


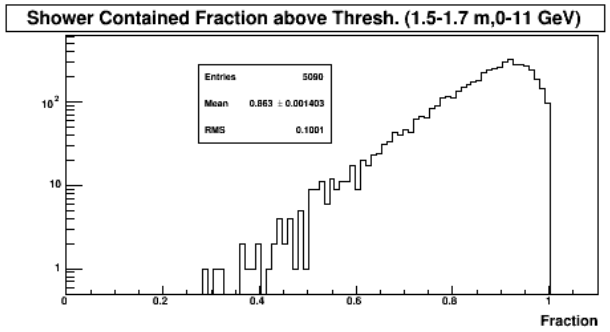


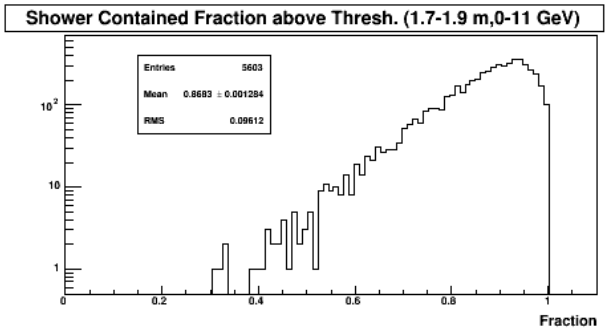
Energy Fraction Contained in blocks above Threshold for π^-

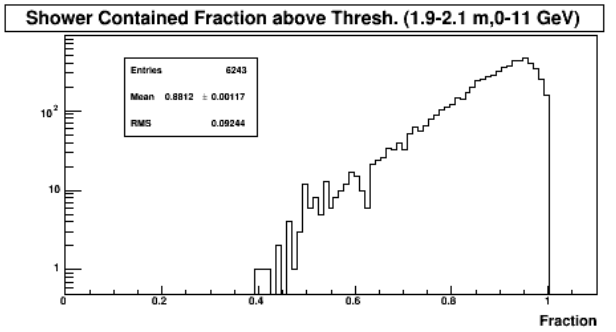


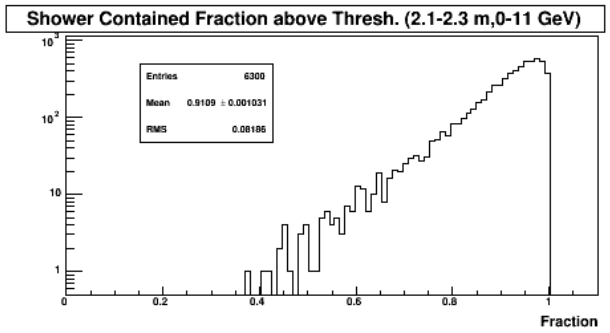


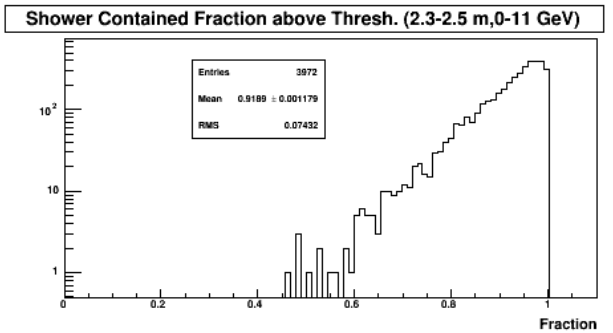


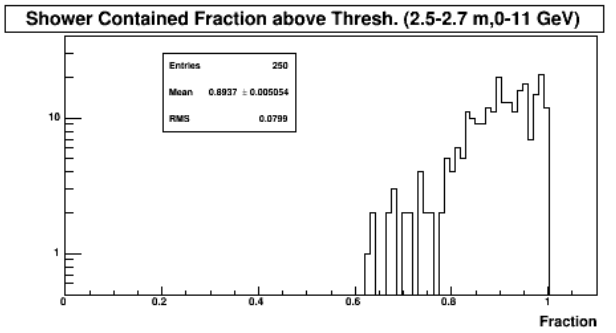




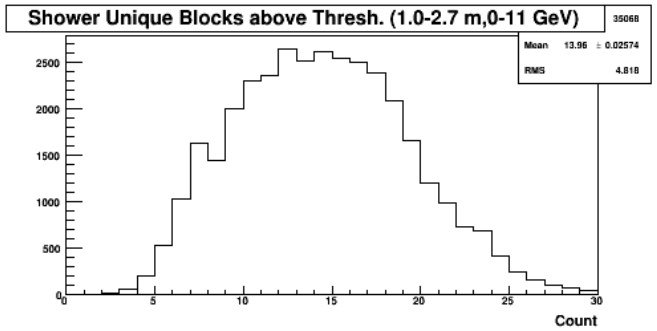


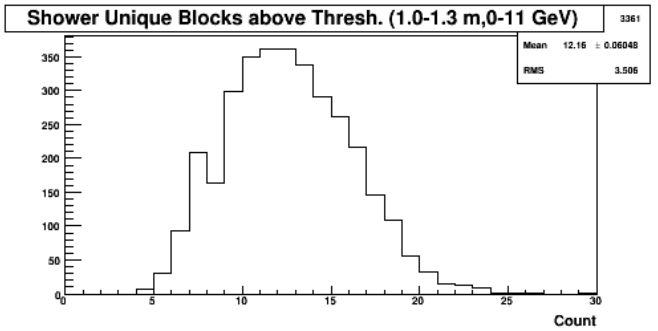


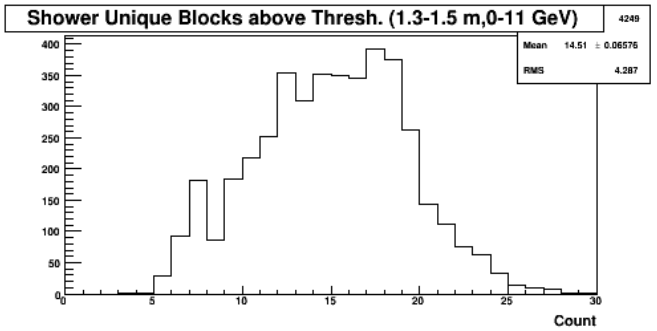


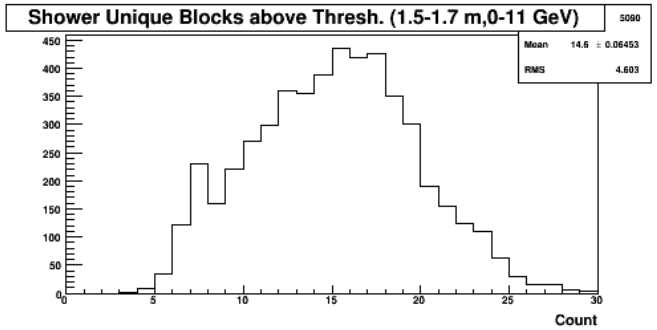


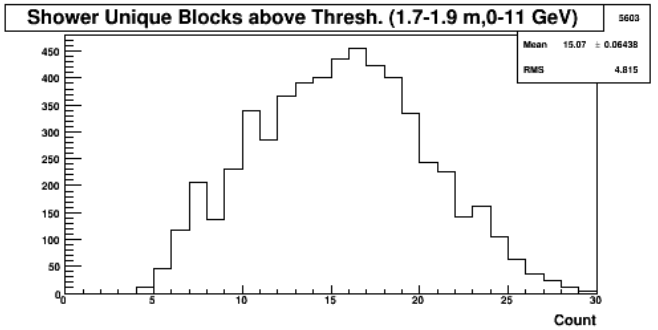
Block Count for Shower 6+1 Clustering for π^- with 1 MeV Cut

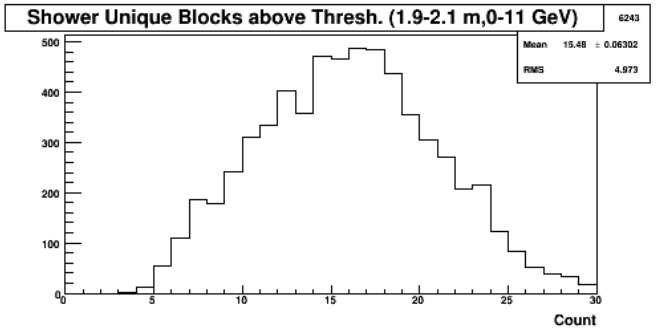


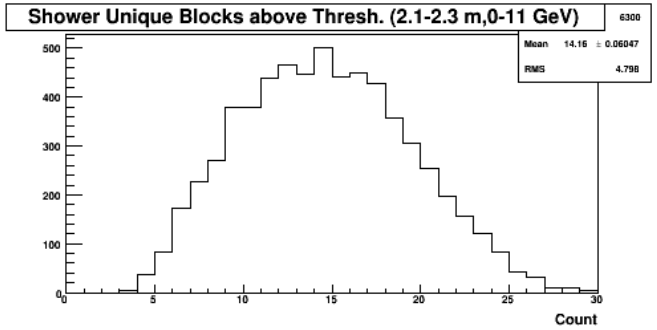


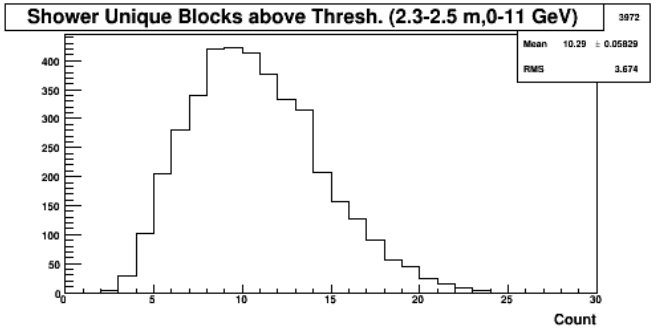


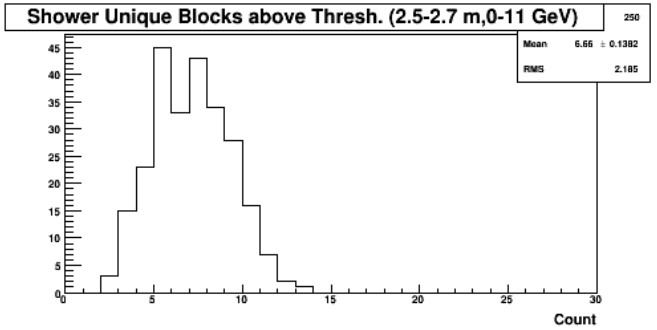




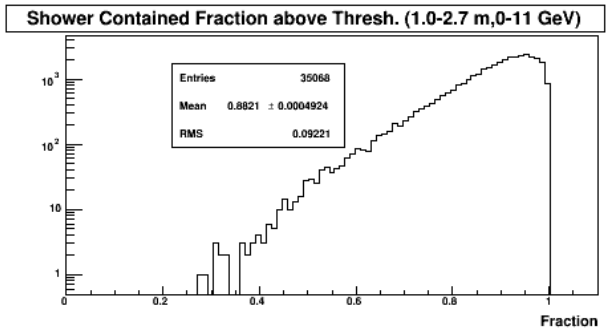


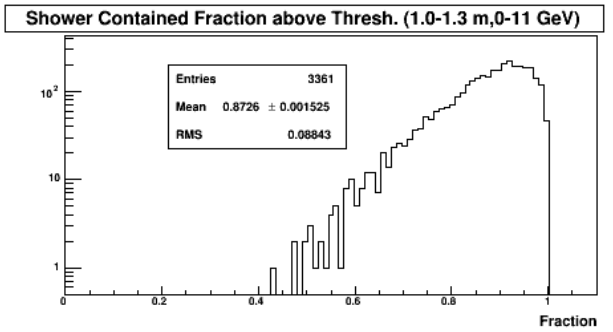


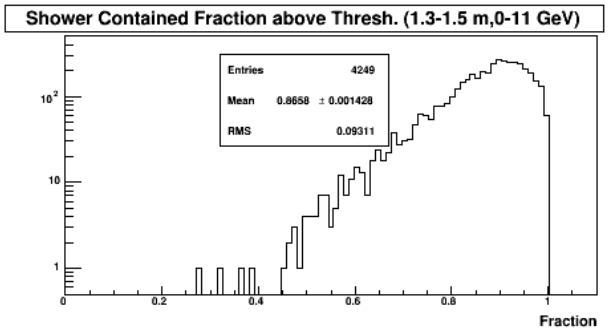


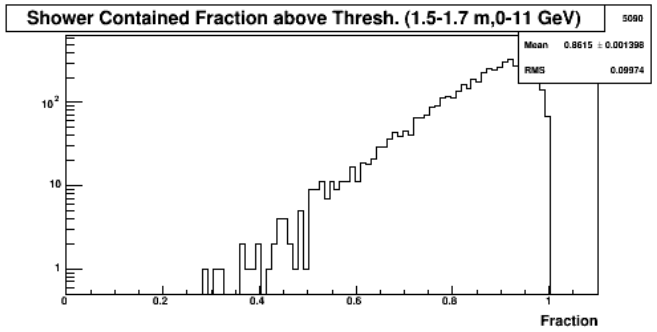


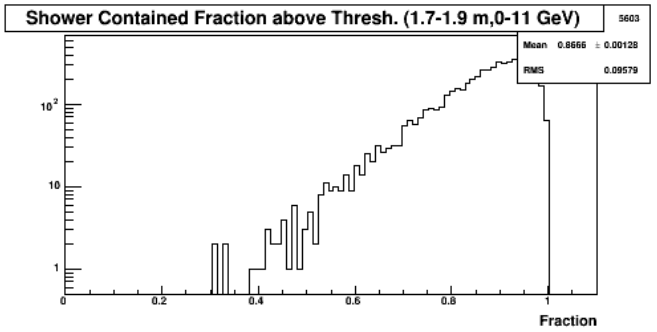
Energy Fraction Contained in blocks above Threshold for π^- with 1 MeV Cut

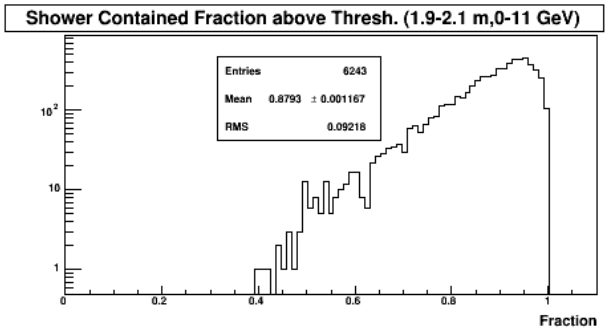


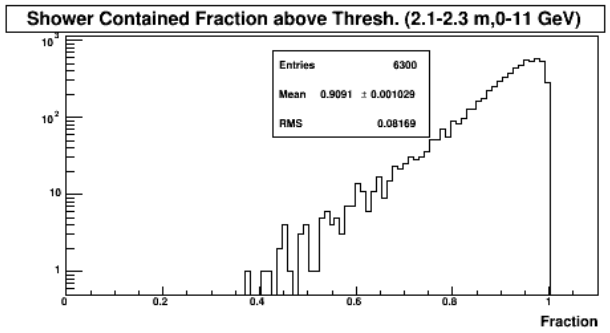


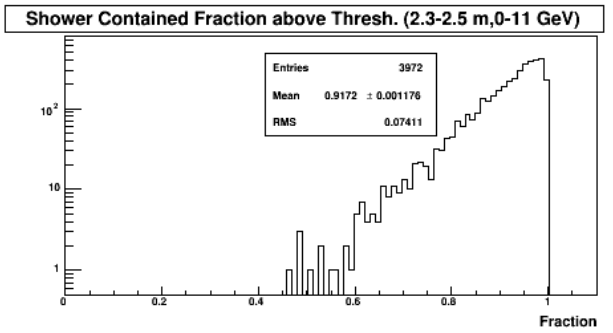


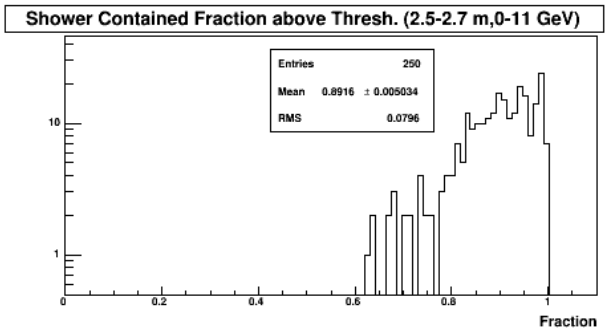




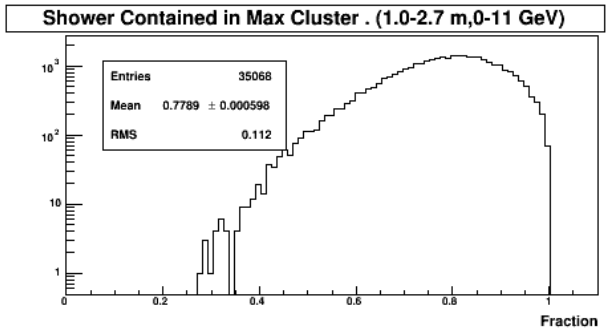


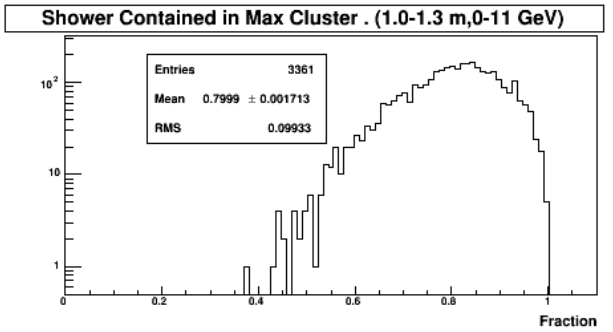


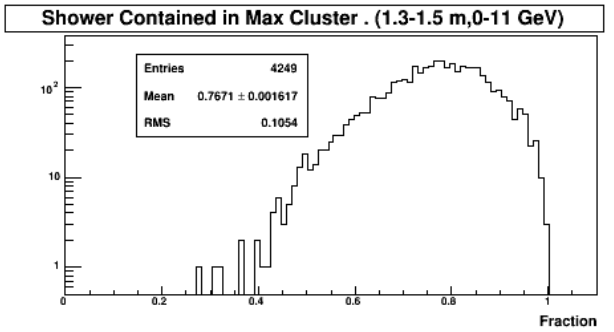


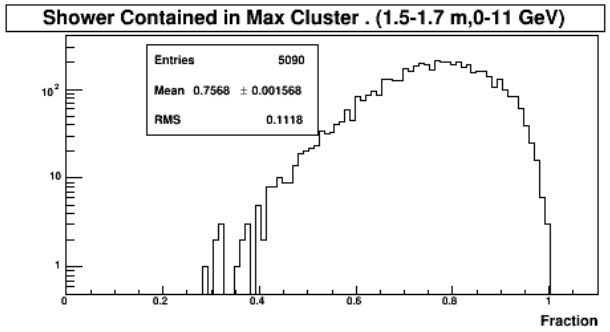


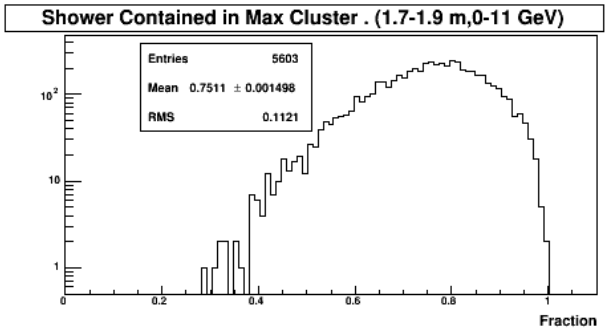
Energy Fraction Contained in Max 6+1 Cluster

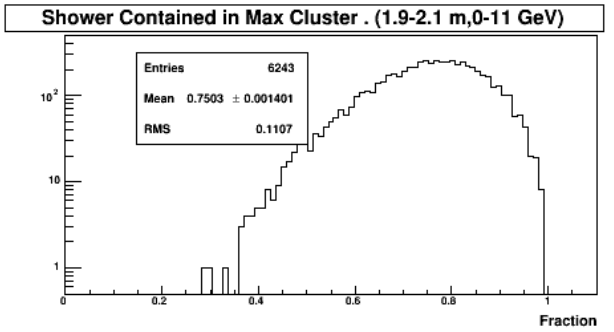


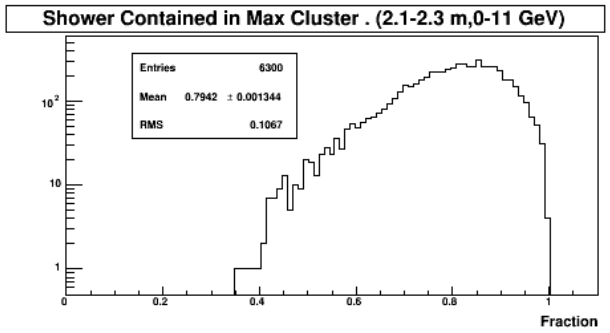


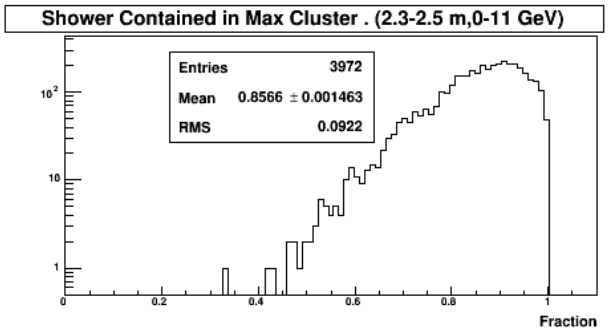


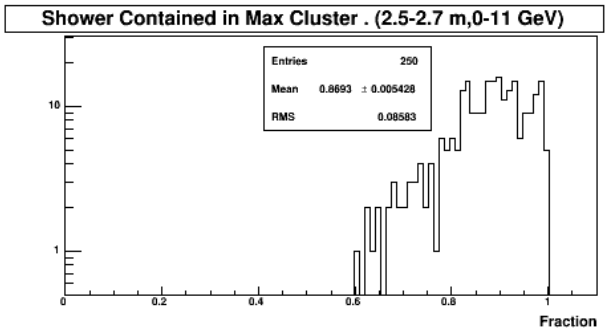








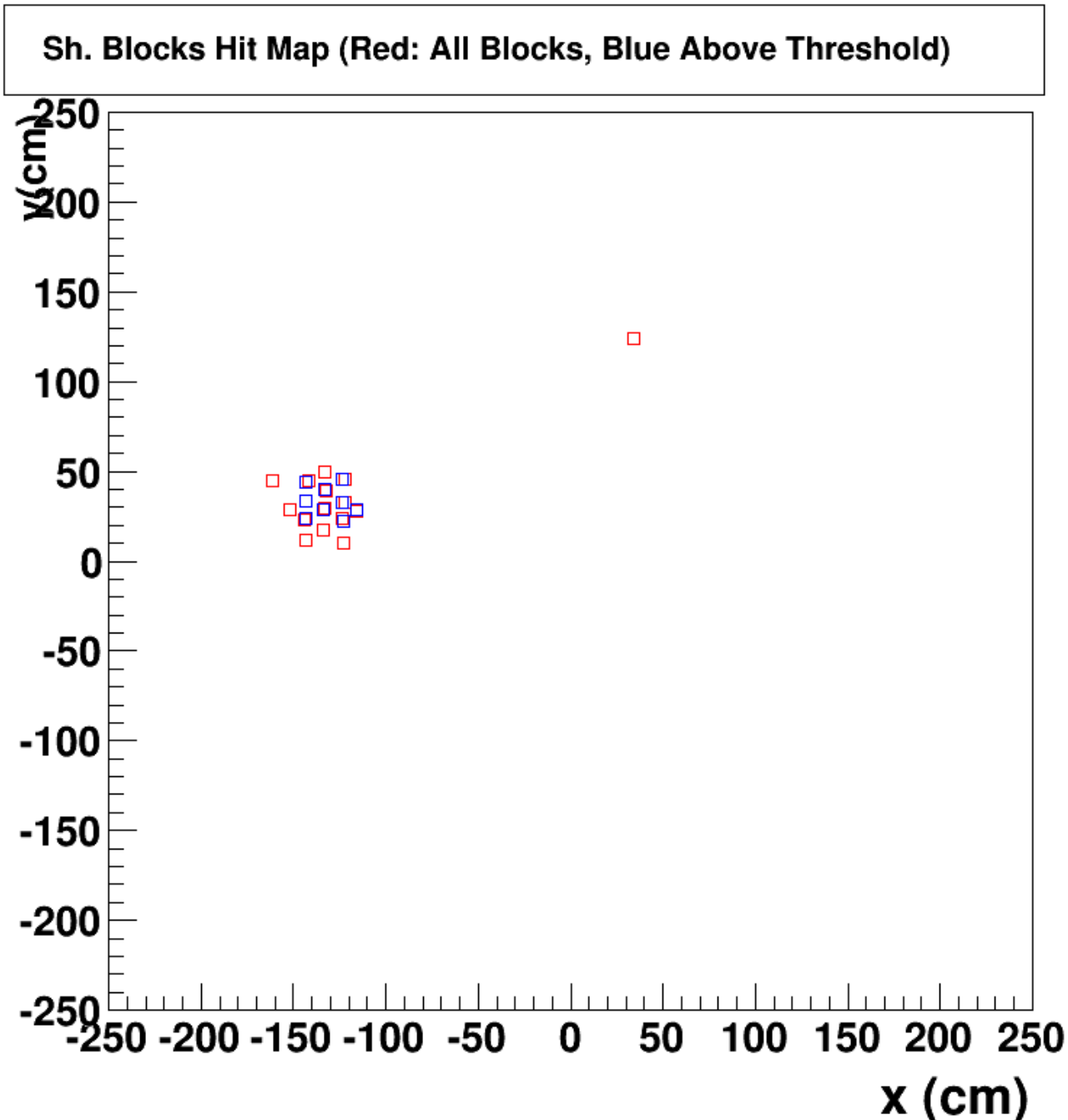




Single Events ECAL Block Distribution

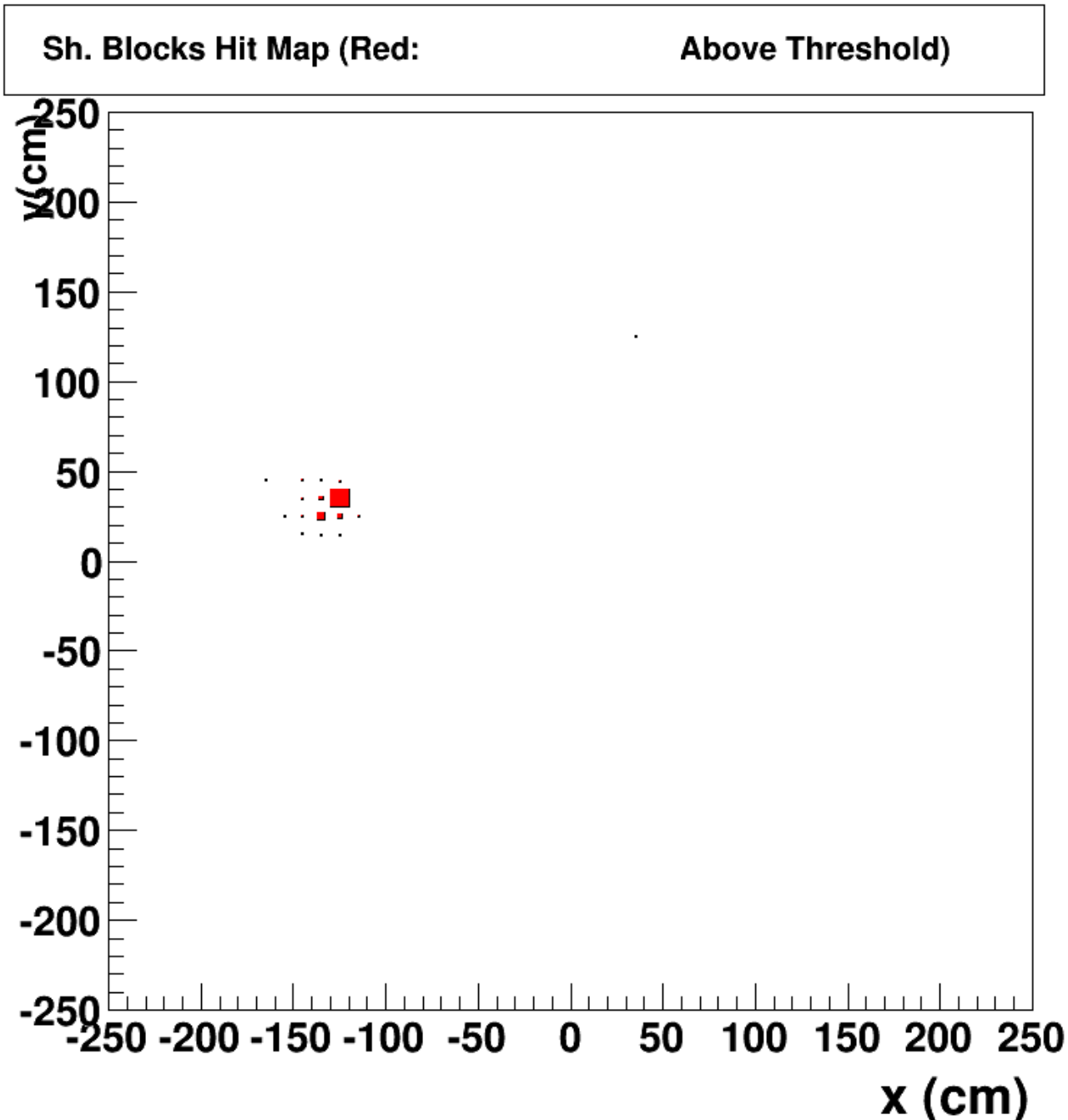
Single e^- Hit on ECAL

Incident Mom. 4 GeV
Incident R 124 cm



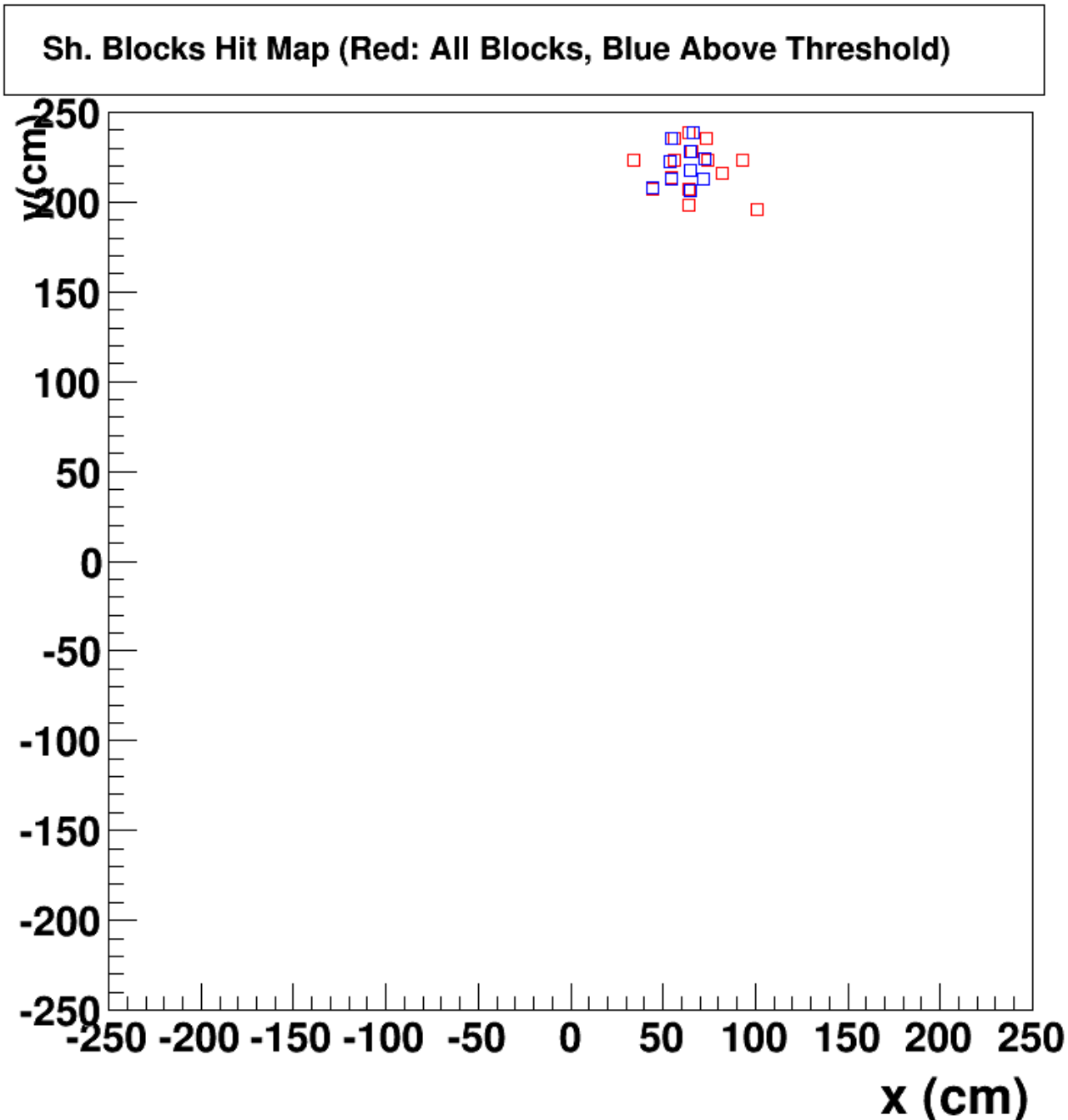
Single e^- Hit on ECAL

Incident Mom. 4 GeV
Incident R 124 cm
Energy weighted



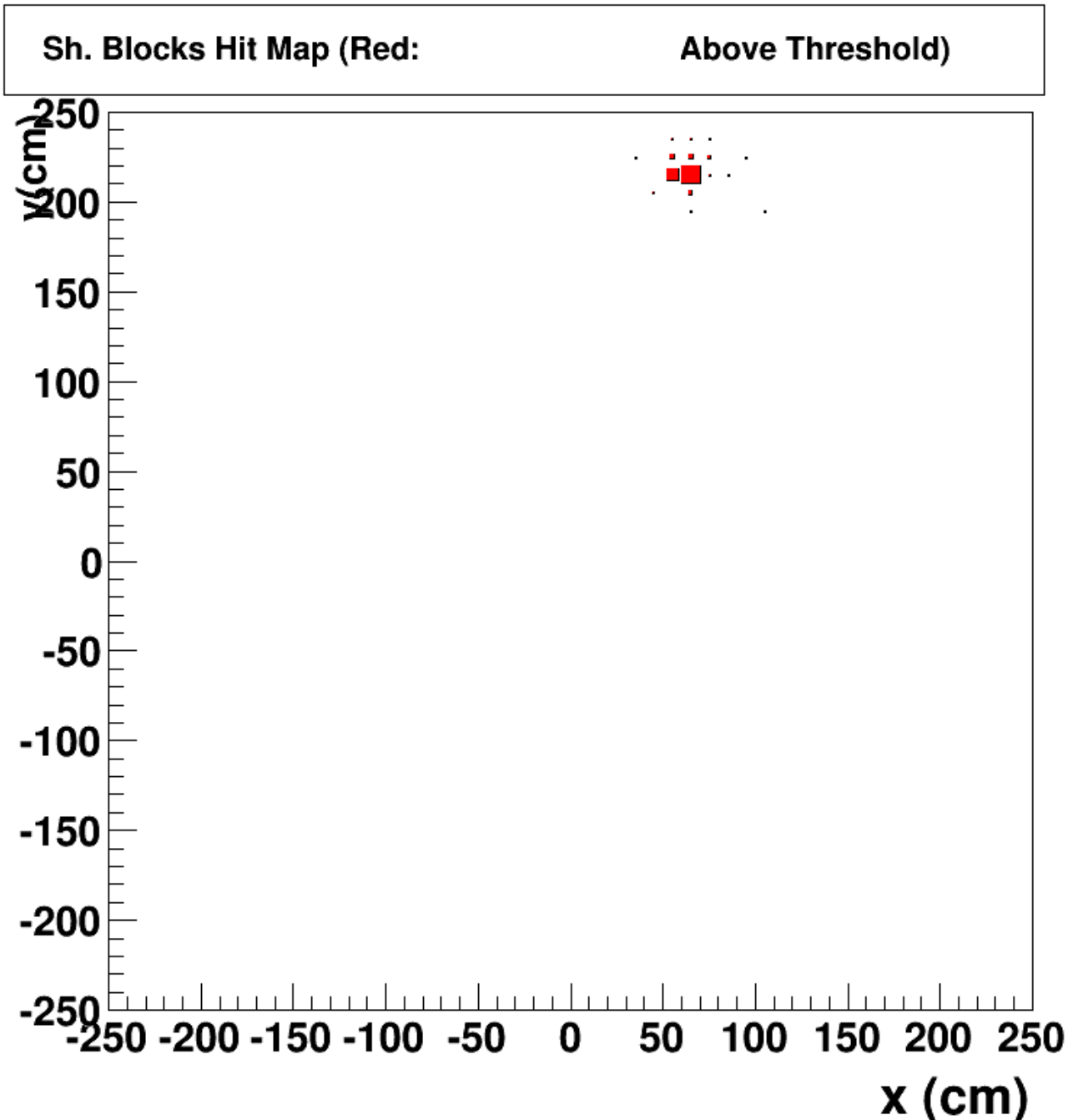
Single e^- Hit on ECAL

Incident Mom. 3 GeV
Incident R 216 cm



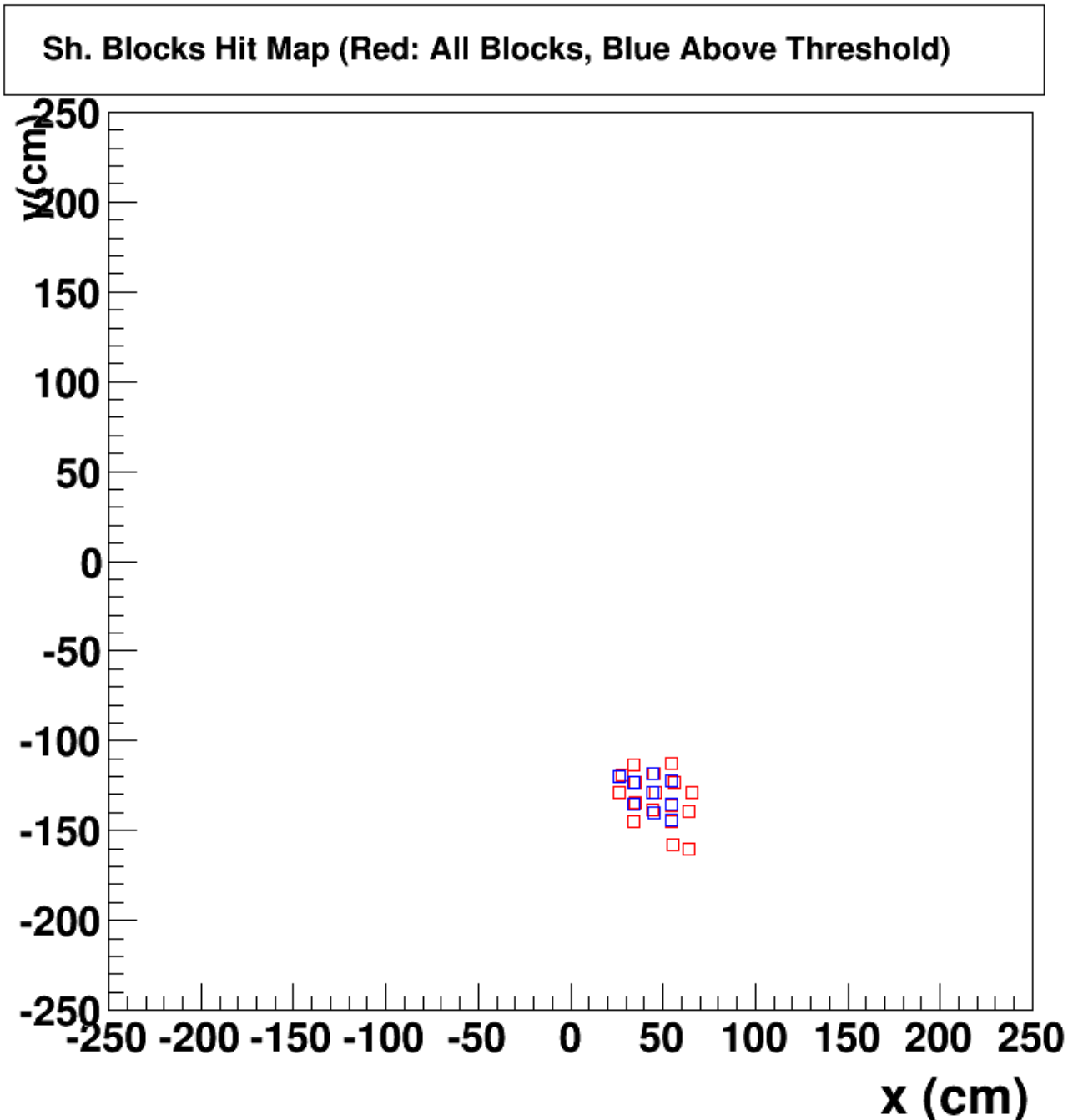
Single e^- Hit on ECAL

Incident Mom. 3 GeV
Incident R 216 cm
Energy weighted



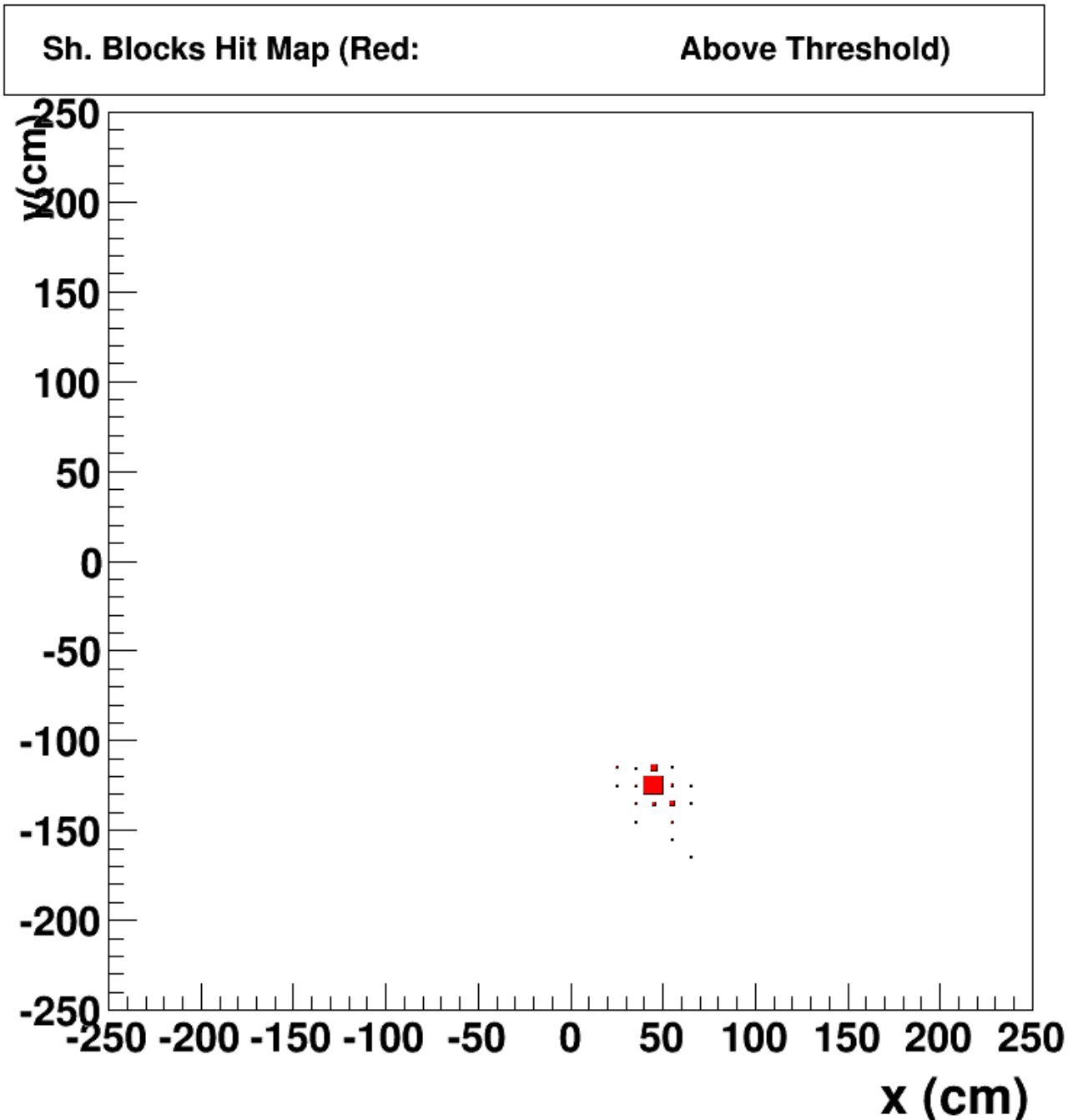
Single e^- Hit on ECAL

Incident Mom. 4 GeV
Incident R 130 cm



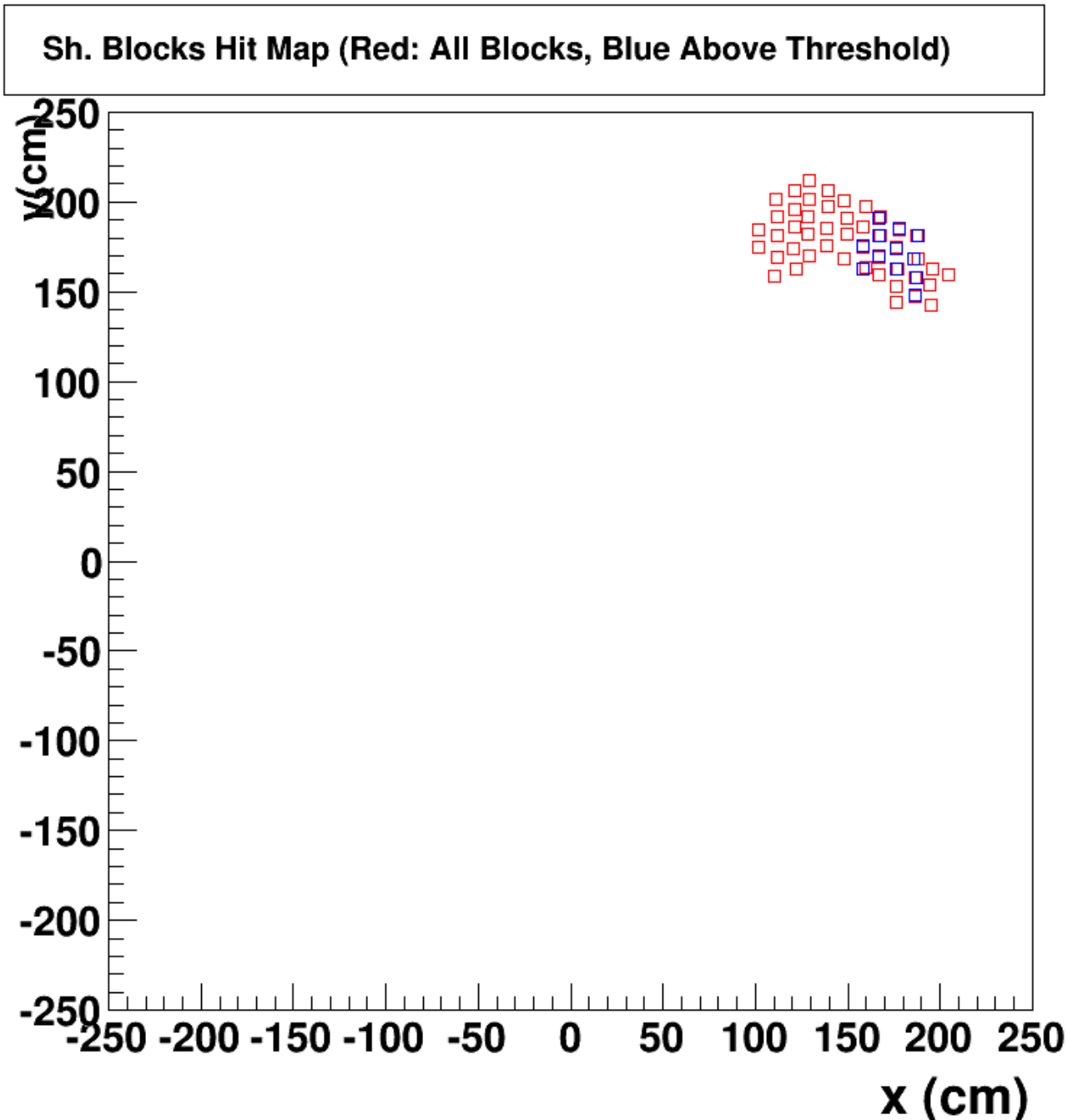
Single e^- Hit on ECAL

Incident Mom. 4 GeV
Incident R 130 cm
Energy weighted



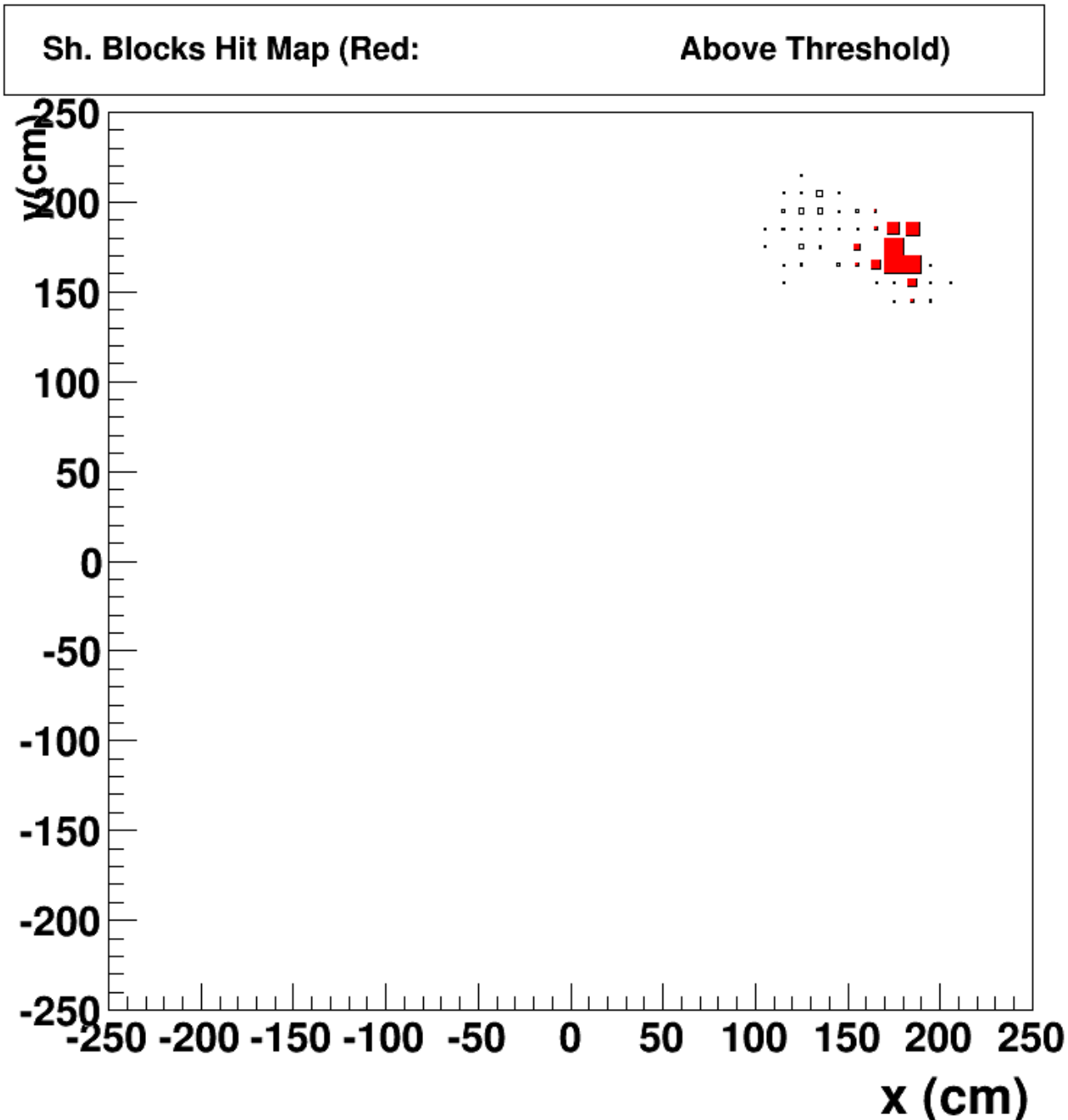
Single π^- Hit on ECAL

Incident Mom. 3 GeV
Incident R 235 cm



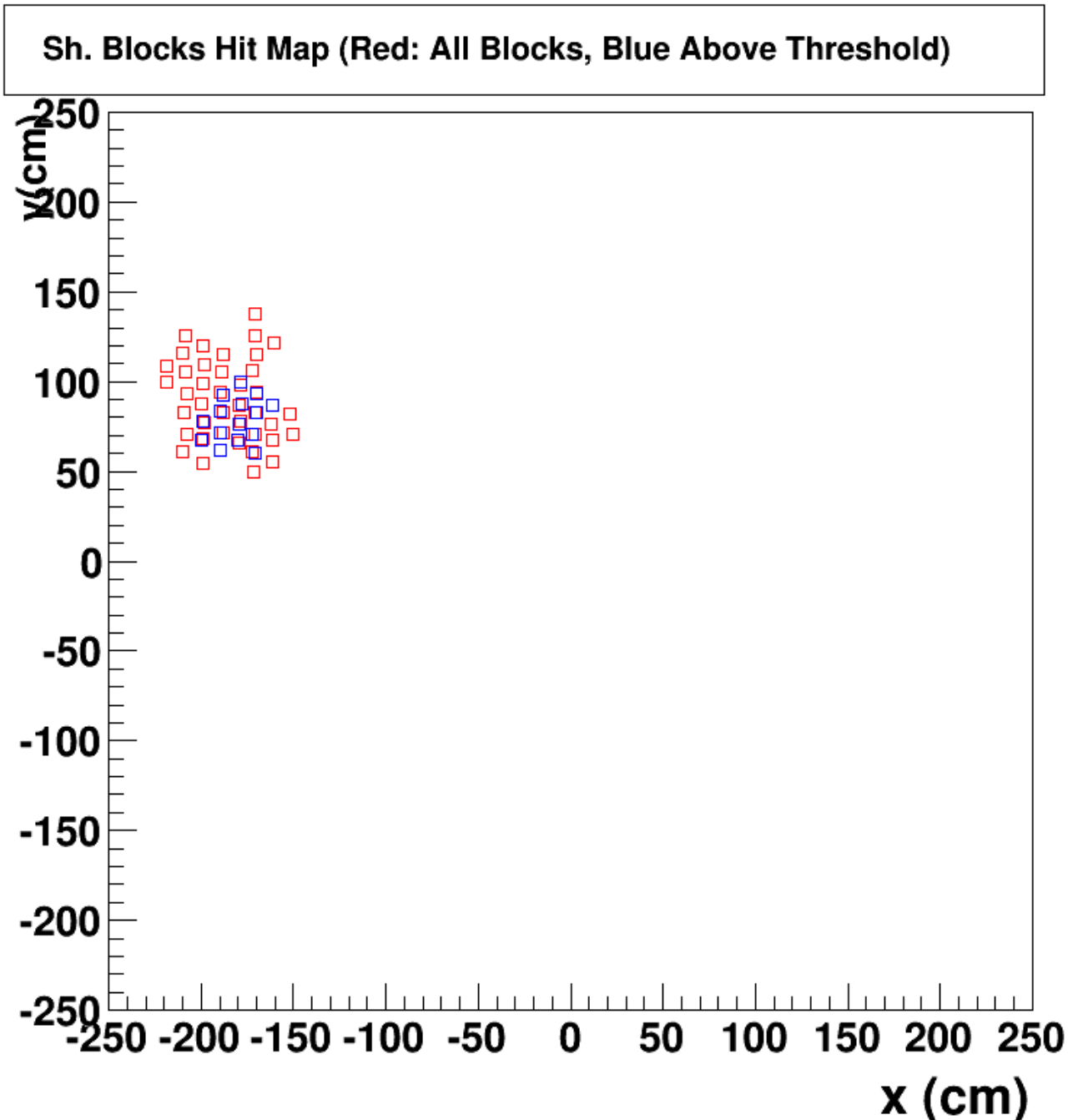
Single π^- Hit on ECAL

Incident Mom. 3 GeV
Incident R 235 cm
Energy weighted



Single π^- Hit on ECAL

Incident Mom. 2 GeV
Incident R 190 cm



Single π^- Hit on ECAL

Incident Mom. 2 GeV
Incident R 190 cm
Energy weighted