OUTLINE

Threshold (minimum gamma) energy in EM barrel detector

- Show a set of figures with different cluster parameters
  - Energy ratio (E_{rec}/E_{thr})
  - Number of event ratio (# of reconstructed events / # of thrown events)

- Cluster parameters
  - Minimum number of hits (5, 15, and 20)
  - Minimum energy deposit (0.5 MeV and 10 MeV)
  - Maximum distance (2 mm and 8 mm)

MINIMUM NUMBER OF HITS = 0 HITS
MINIMUM ENERGY DEPOSIT = 0.0 MEV

Using only imaging layers

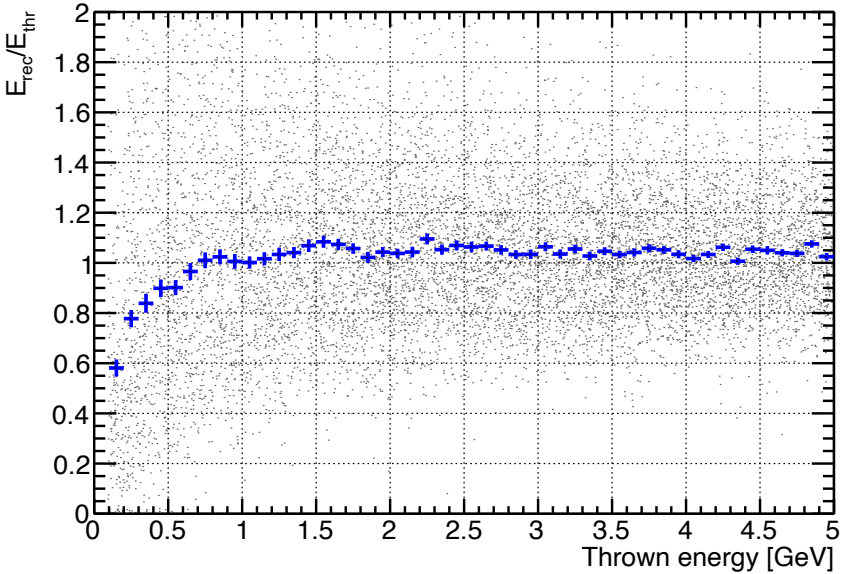
Cuts on clustering algorithm
- Min nhits = 0 hits
- Min cluster edep = 0.0 MeV

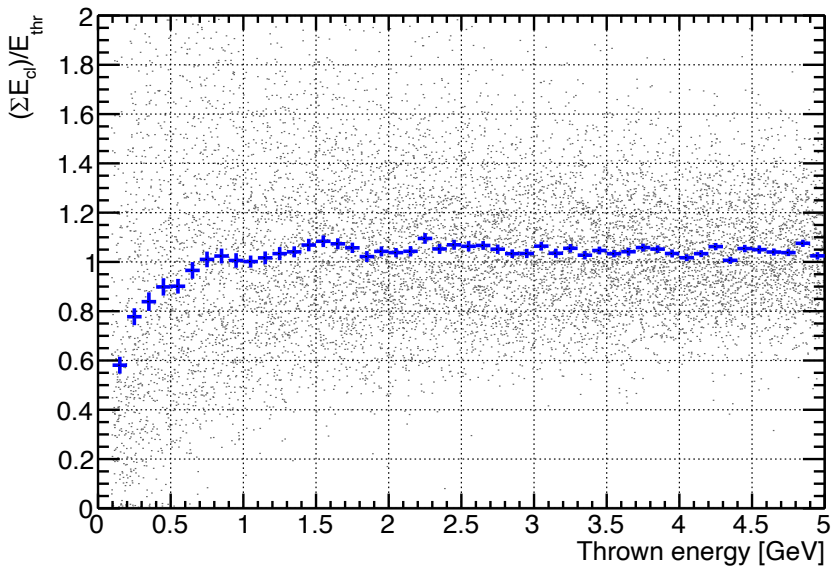
ENERGY RATIO VS THROWN ENERGY

Before Clustering $\frac{E_{rec}}{E_{thr}}$

After Clustering $\frac{\Sigma E_{cluster}}{E_{thr}}$

here E_{rec} and $E_{cluster}$ already applied sampling fraction (0.7%)





Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 0 hits
- Min cluster edep = 0.0 MeV

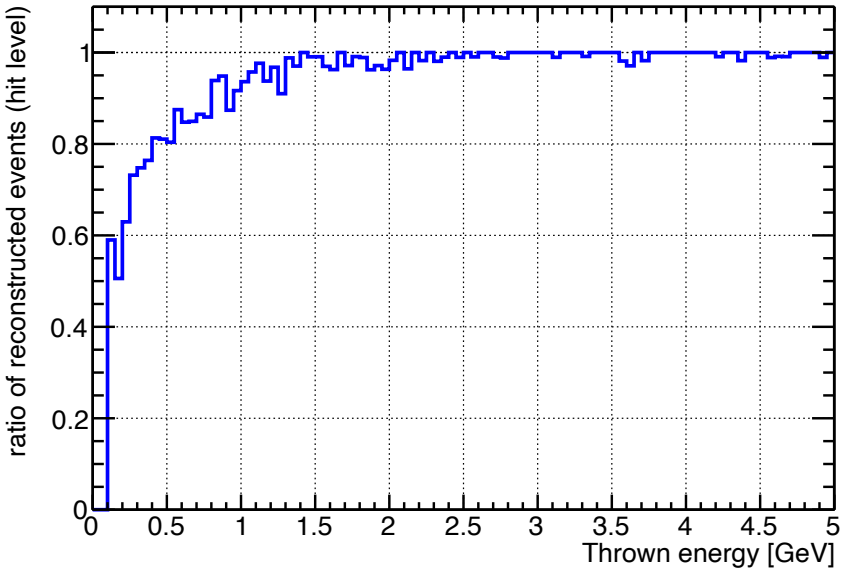
RATIO OF RECONSTRUCTED EVENTS

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}

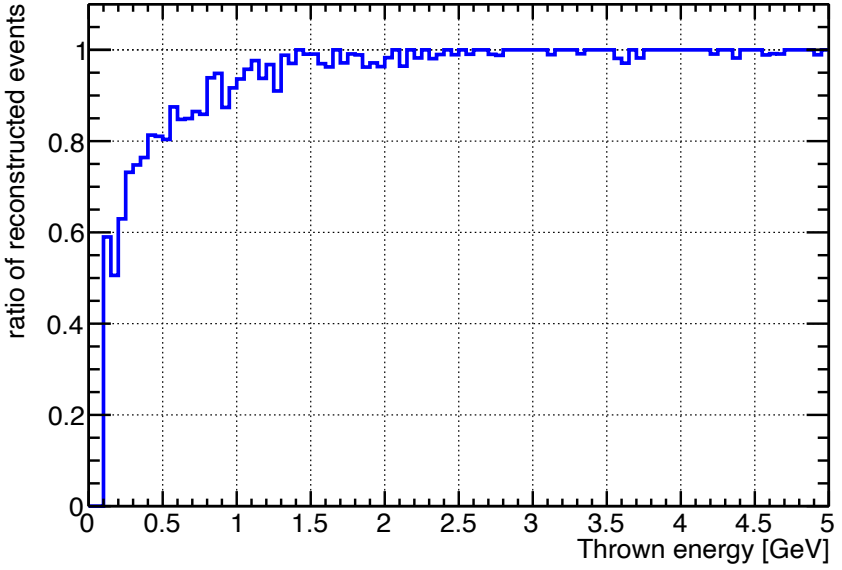
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 0 hits
- Min cluster edep = 0.0 MeV

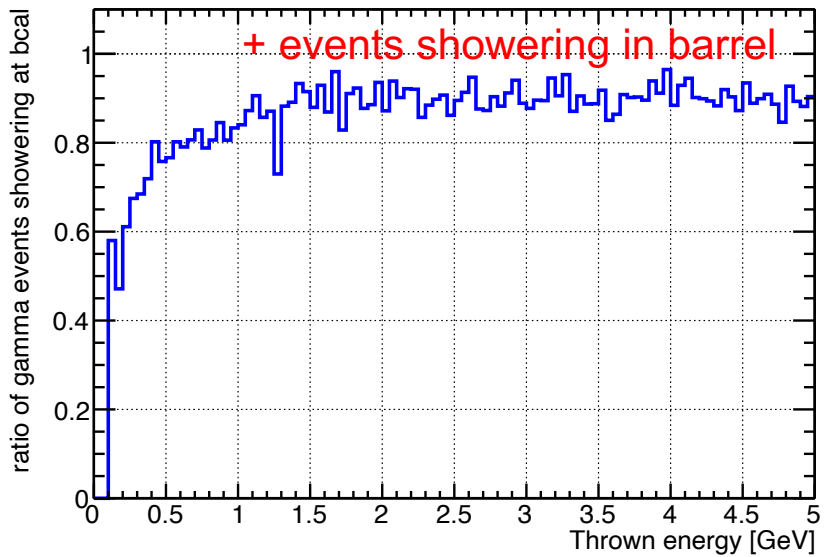
GAMMA SHOWERING AT BARREL

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}
+ events showering in barrel

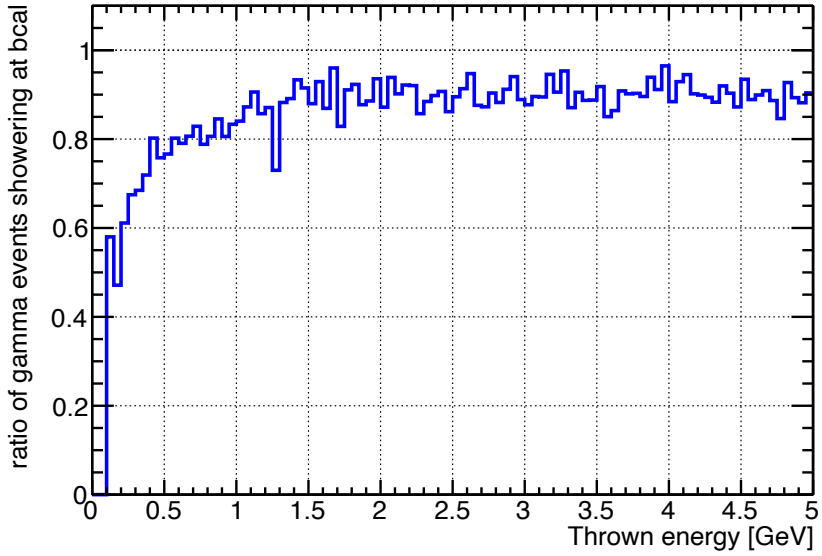
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 0 hits
- Min cluster edep = 0.0 MeV

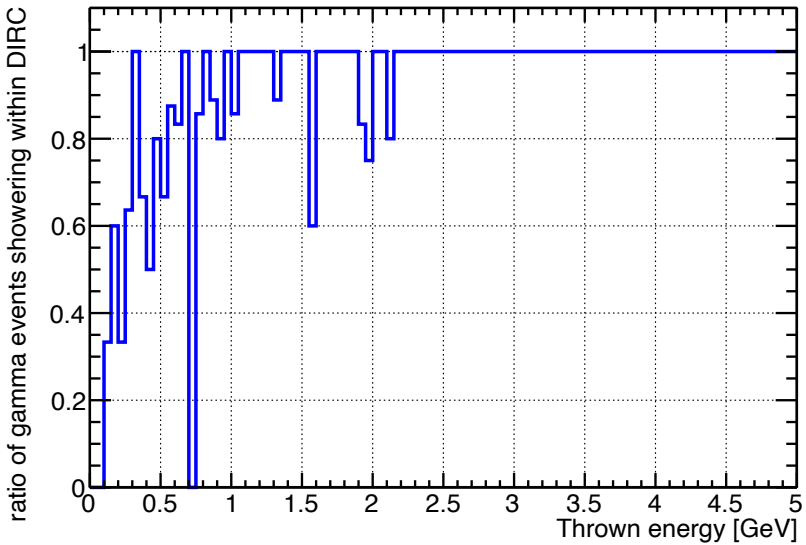
GAMMA SHOWERING AT DIRC (2/2)

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events\ showering\ at\ DIRC}$

+ events showering in DIRC

Before Clustering

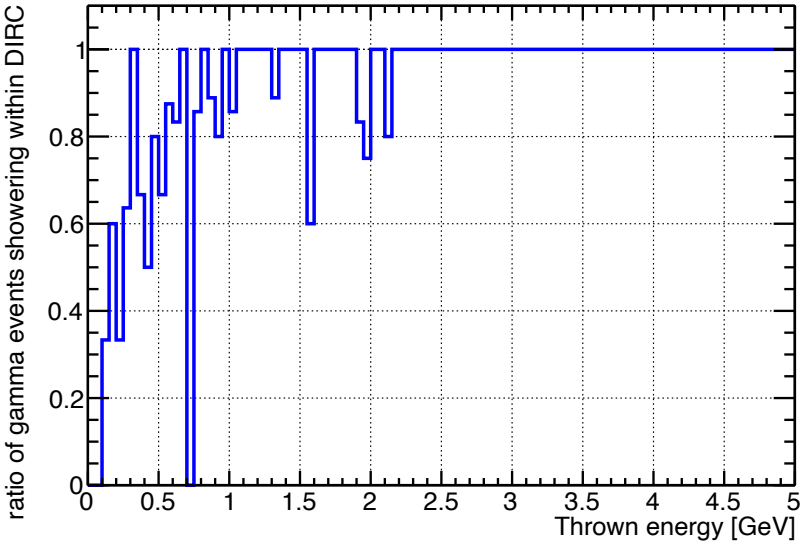
Cut on events' E_{rec} > 50% of E_{thr}



+ events' E_{rec} > 50% of E_{thr}
+ events showering in DIRC

After Clustering

Cut on events with at least 1 cluster



MINIMUM NUMBER OF HITS = 15 HITS
MINIMUM ENERGY DEPOSIT = 0.5 MEV

Using only imaging layers

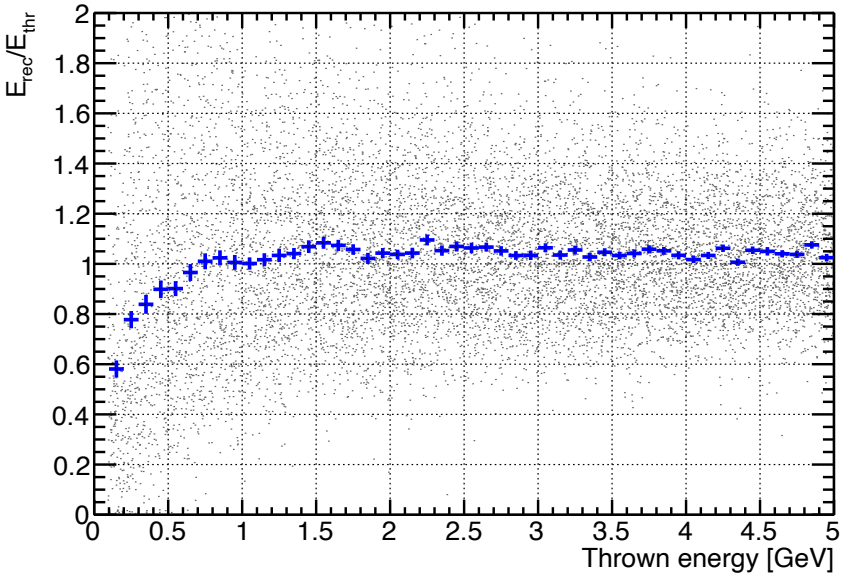
Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 0.5 MeV

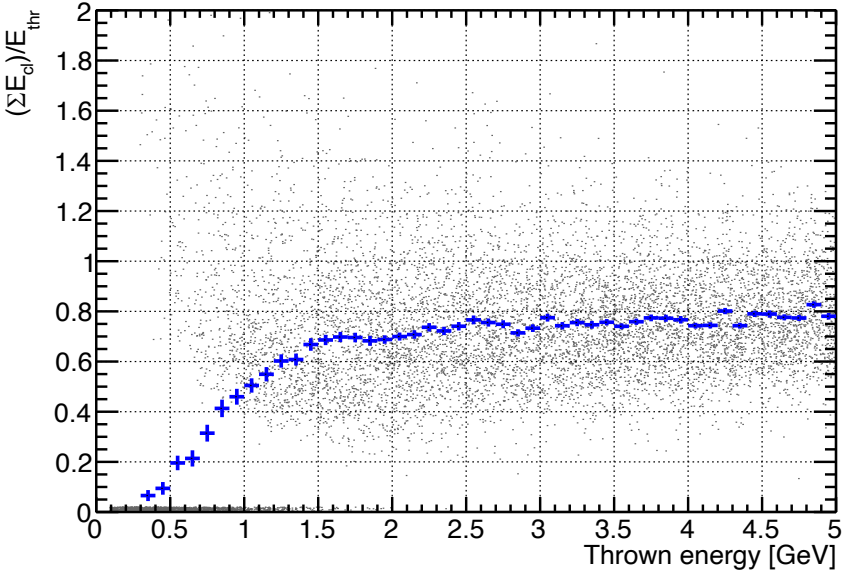
ENERGY RATIO VS THROWN ENERGY

Before Clustering $\frac{E_{rec}}{E_{thr}}$

After Clustering $\frac{\Sigma E_{cluster}}{E_{thr}}$

here E_{rec} and $E_{cluster}$ already applied sampling fraction (0.7%)





Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 0.5 MeV

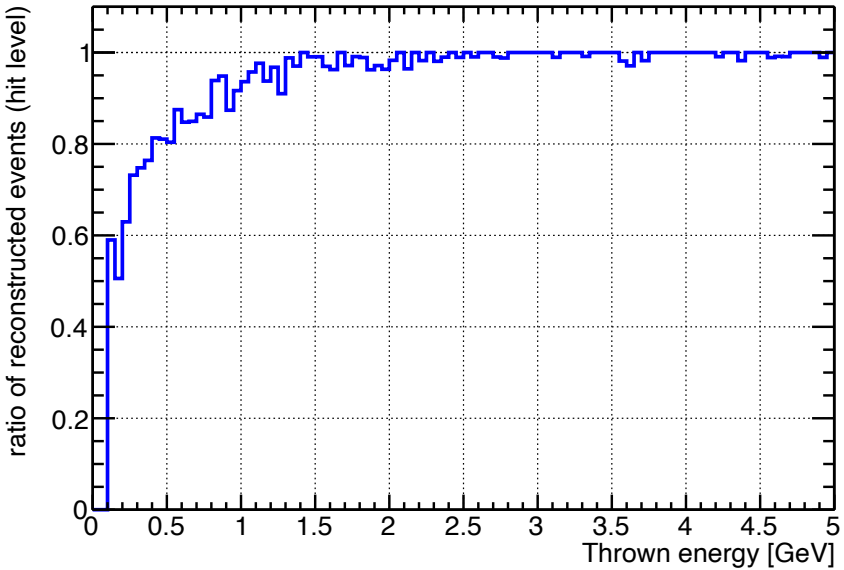
RATIO OF RECONSTRUCTED EVENTS

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}

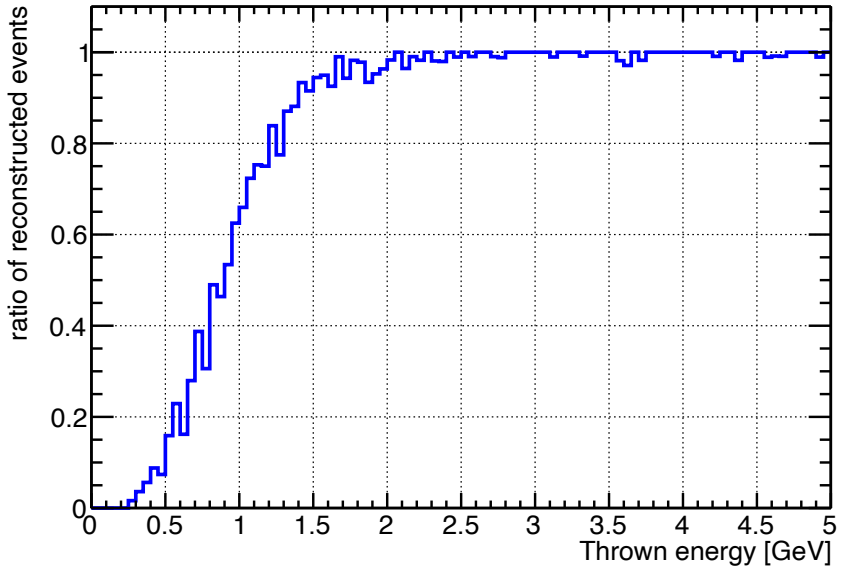
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 0.5 MeV

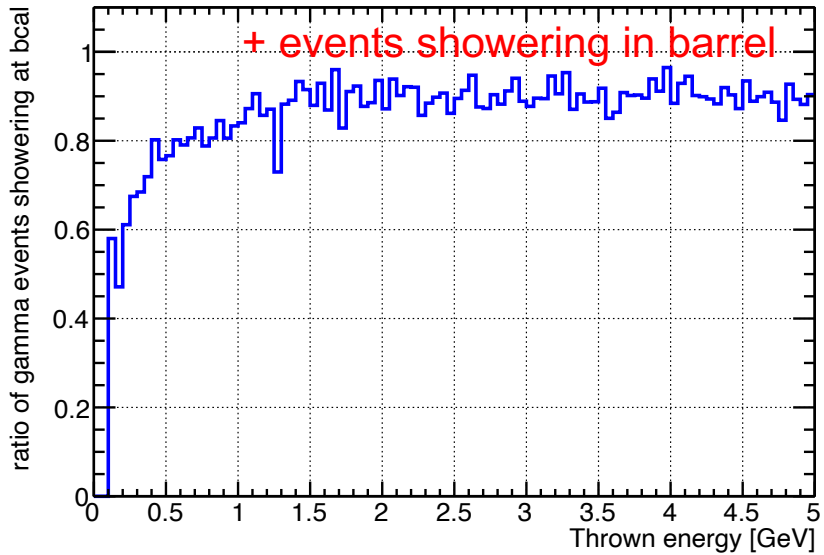
GAMMA SHOWERING AT BARREL

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}
+ events showering in barrel

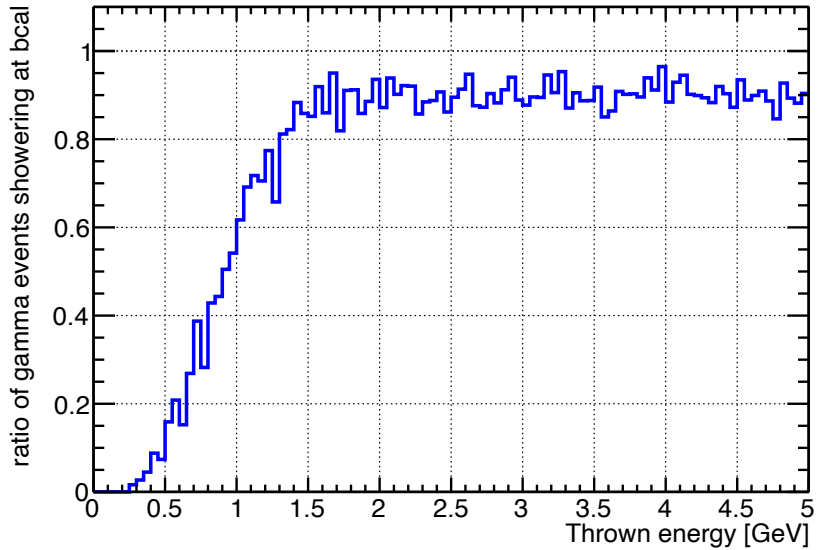
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 0.5 MeV

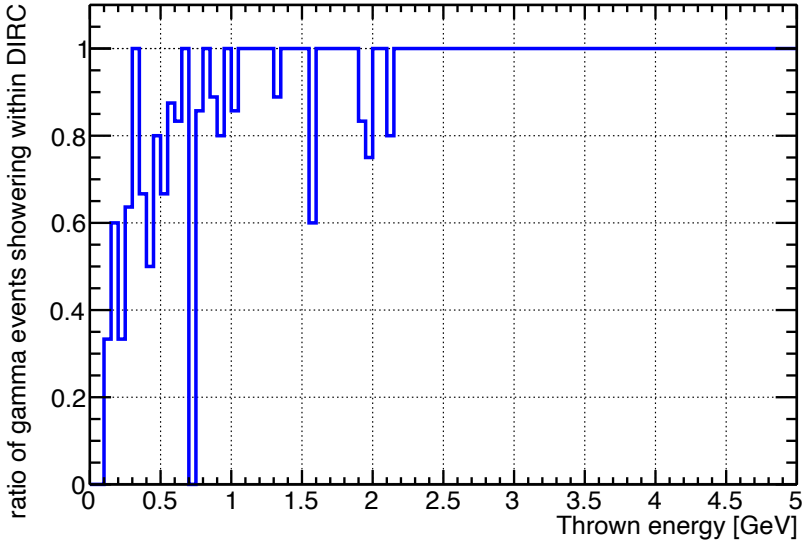
GAMMA SHOWERING AT DIRC (2/2)

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events\ showering\ at\ DIRC}$

+ events showering in DIRC

Before Clustering

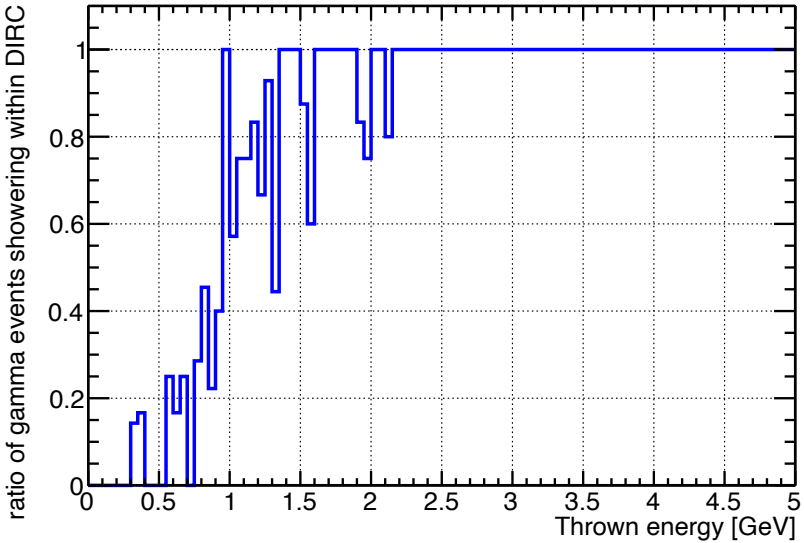
Cut on events' E_{rec} > 50% of E_{thr}



+ events' E_{rec} > 50% of E_{thr}
+ events showering in DIRC

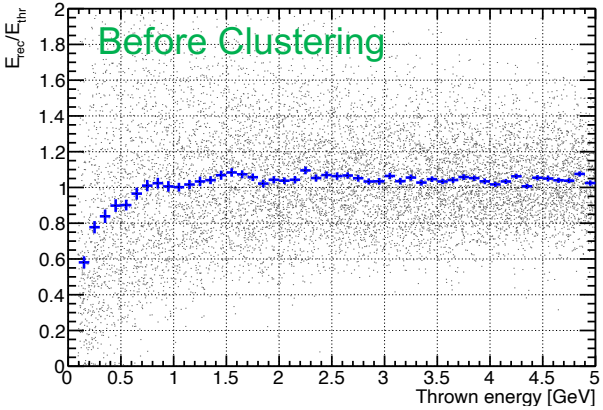
After Clustering

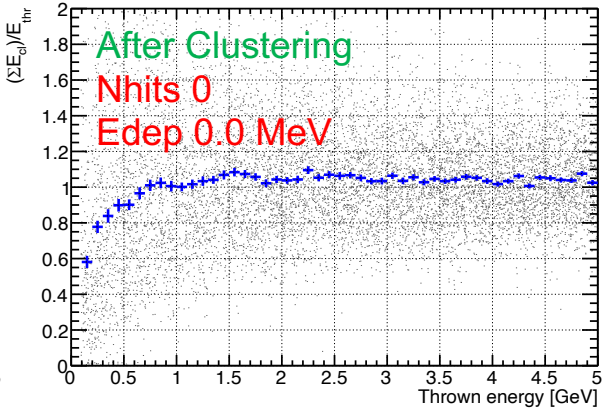
Cut on events with at least 1 cluster

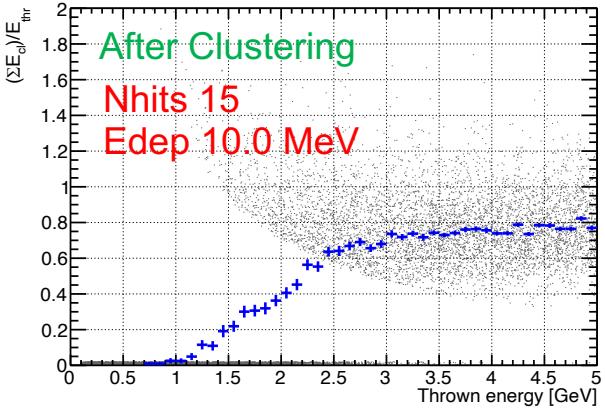


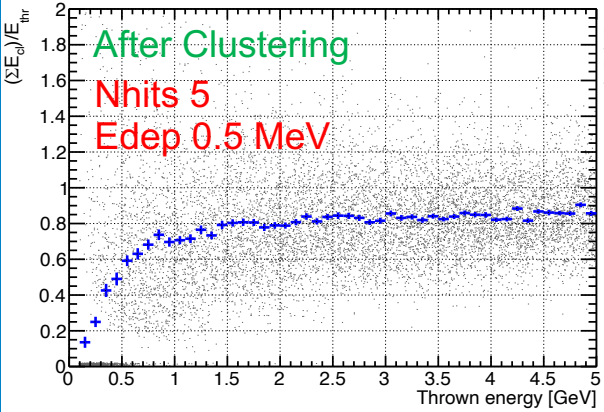
SUMMARY PLOTS
WITH ALL DIFFERENT CLUSTER PARAMETERS

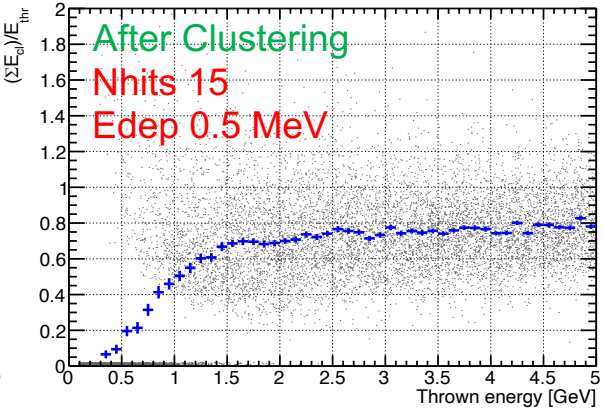
ENERGY RATIO VS THROWN ENERGY

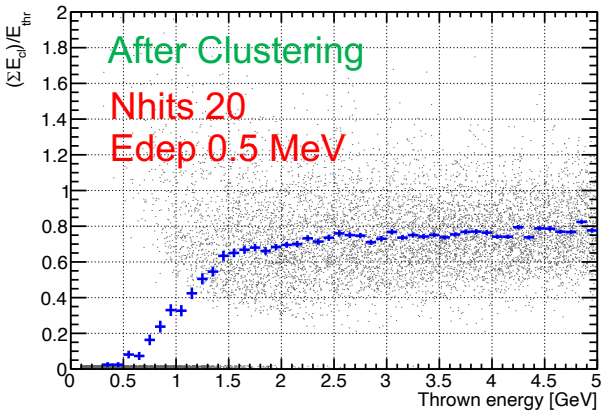








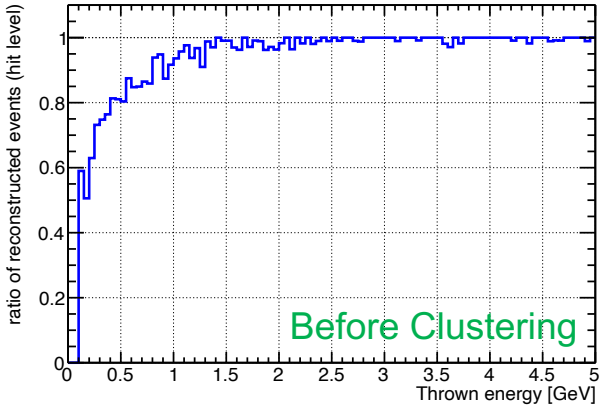


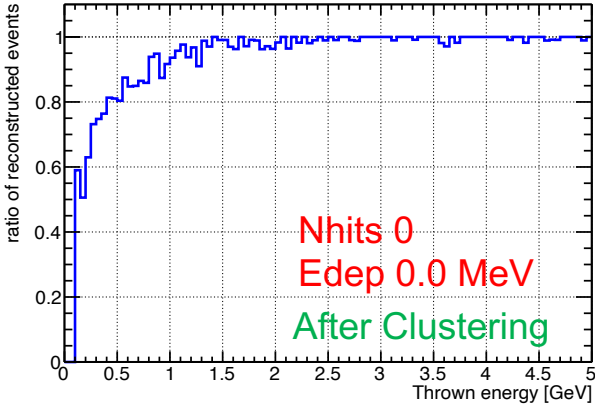


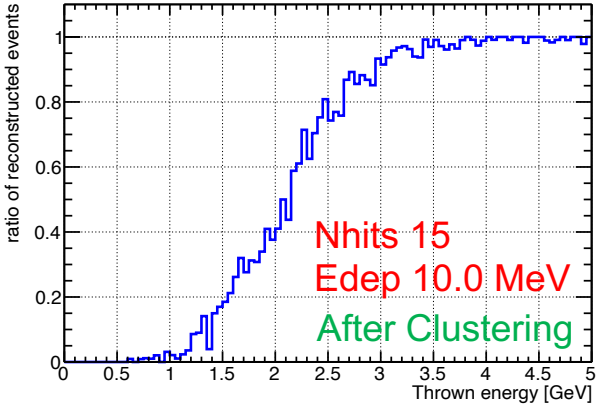
Using only imaging layers

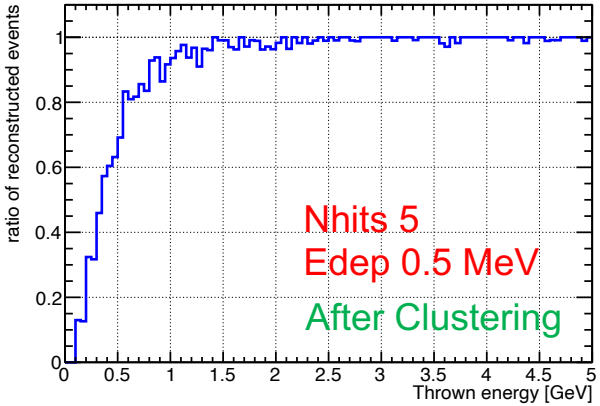
Additional Cut: E_{rec} > 50% of E_{thr}

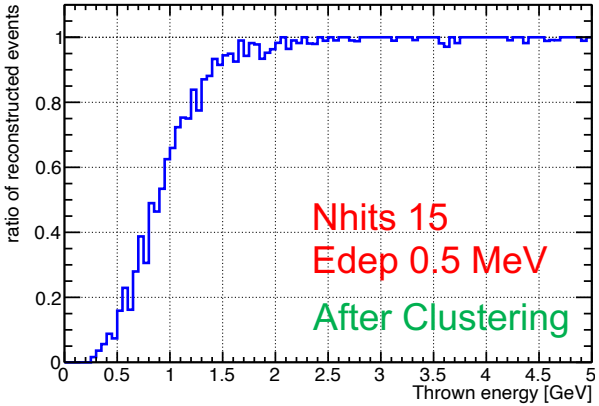
RATIO OF RECONSTRUCTED EVENTS

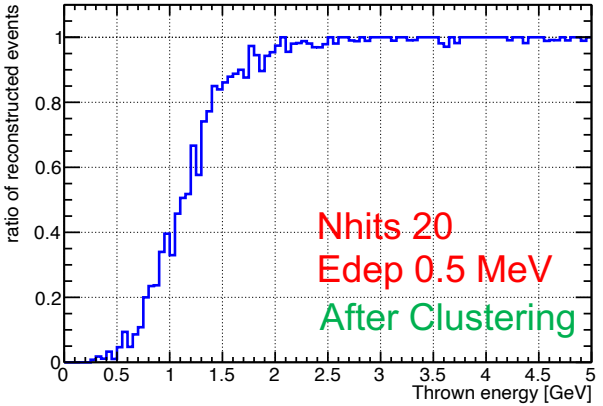








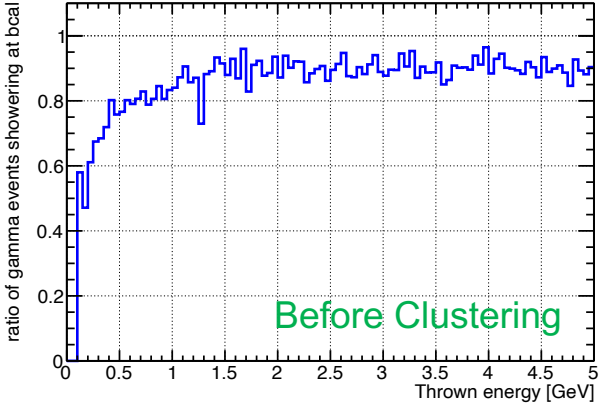


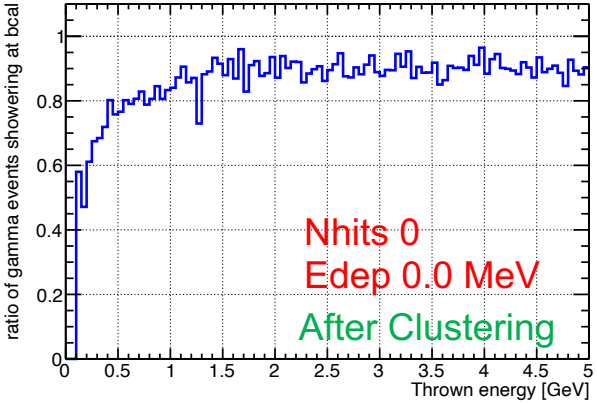


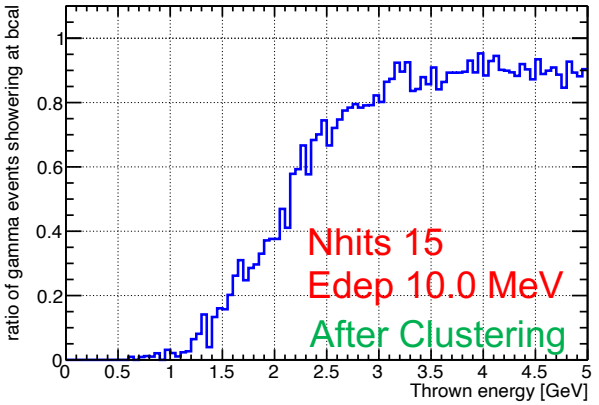
Using only imaging layers

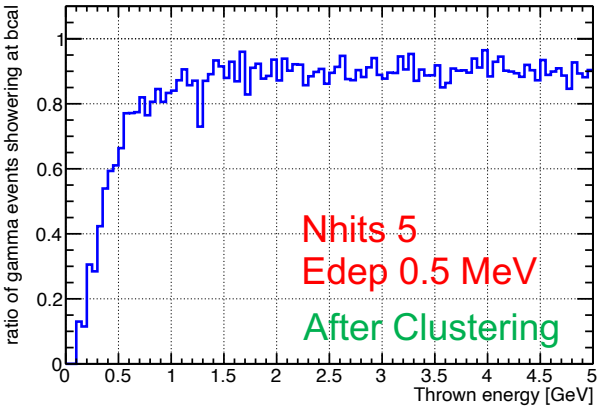
Additional Cuts: E_{rec} > 50% of E_{thr}
+ Showering in barrel

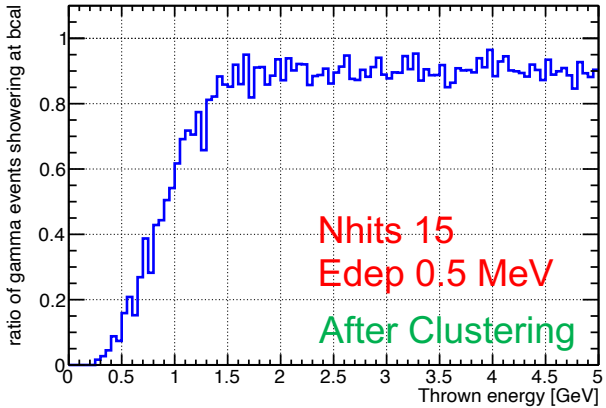
GAMMA SHOWERING AT BARREL

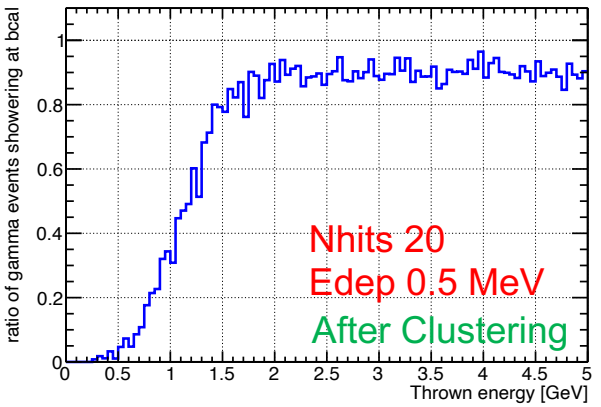








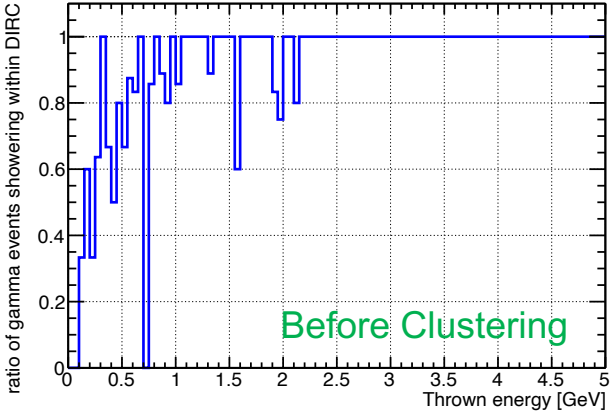


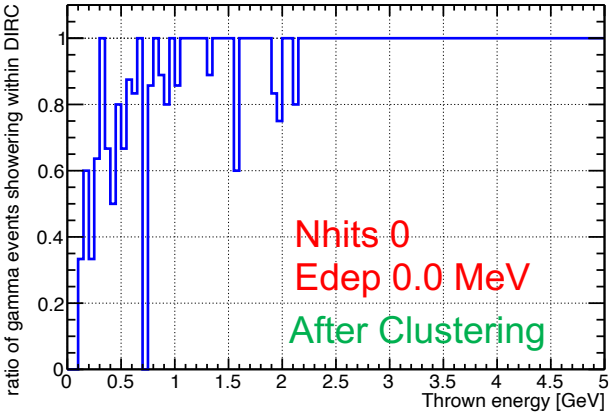


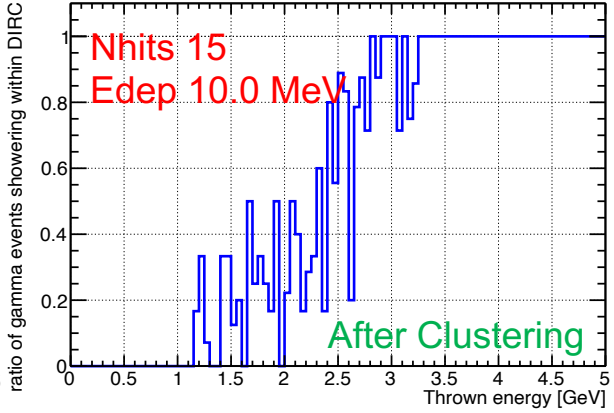
Using only imaging layers

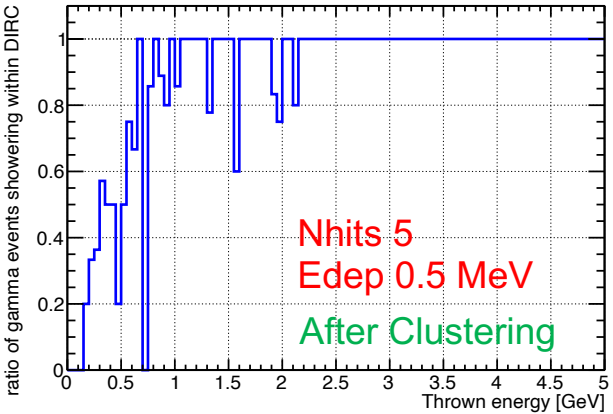
Additional Cuts: E_{rec} > 50% of E_{thr} + Showering in DIRC

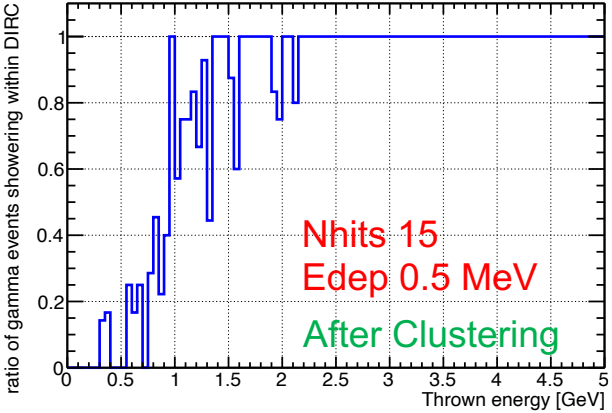
GAMMA SHOWERING AT DIRC

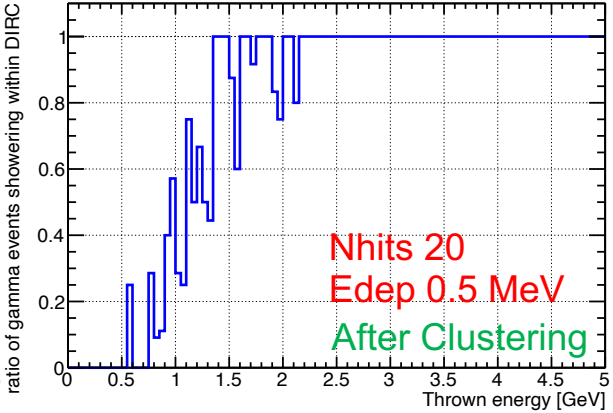










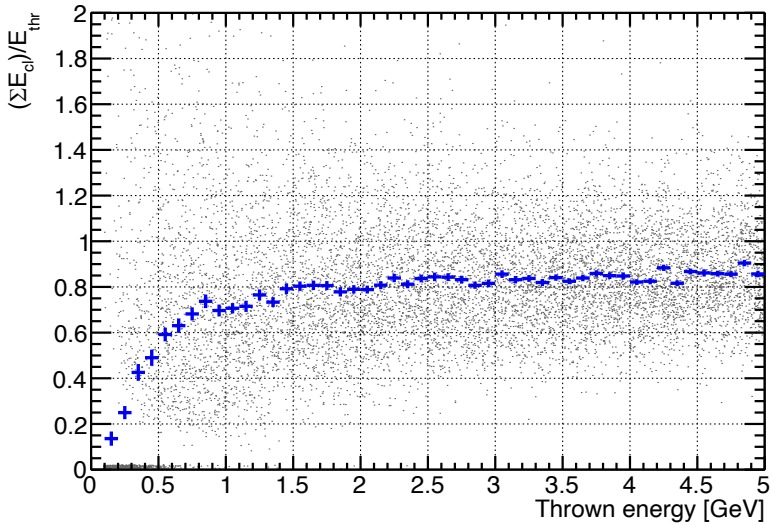


DISTANCE PARAMETER

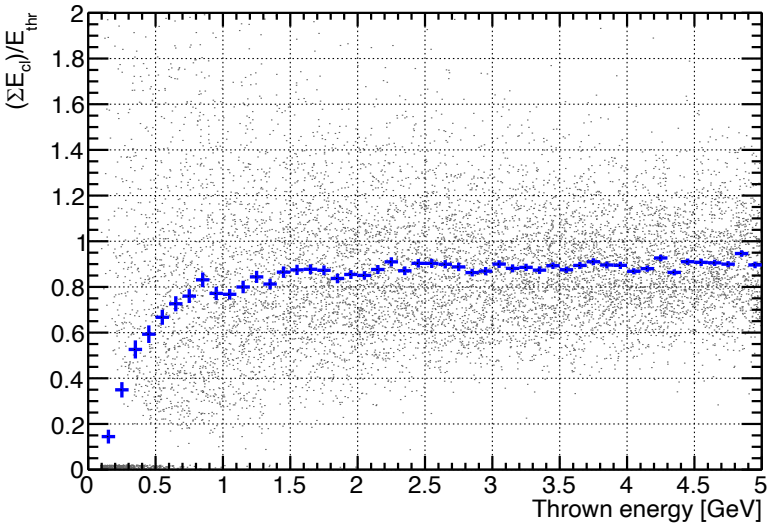
Using only imaging layers

ENERGY RATIO VS THROWN ENERGY

min nhits = 5
Edep = 0.5 MeV
DistXY = 2 mm



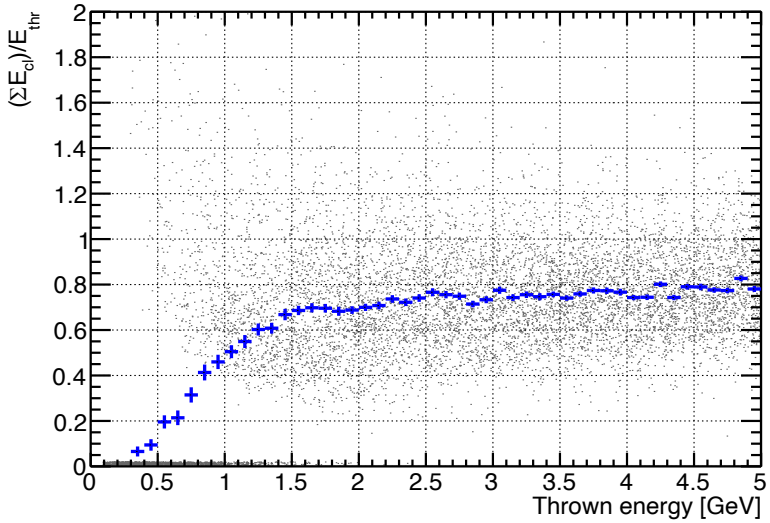
min nhits = 5
Edep = 0.5 MeV
DistXY = 8 mm



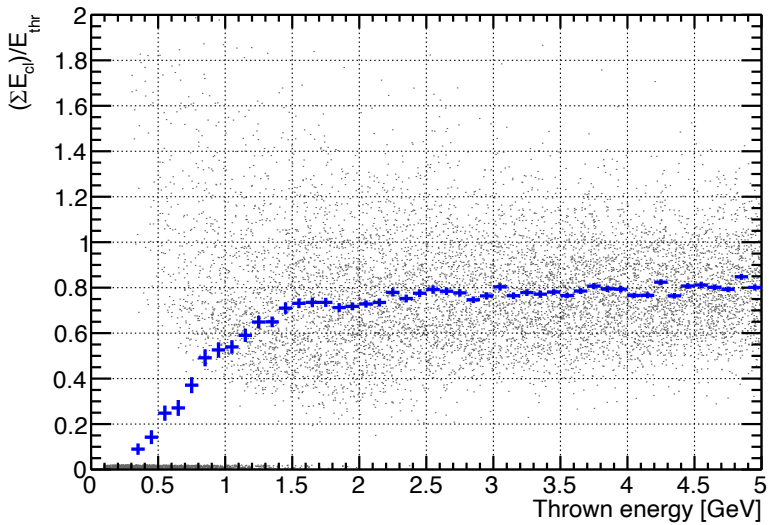
Using only imaging layers

ENERGY RATIO VS THROWN ENERGY

min nhits = 15
Edep = 0.5 MeV
DistXY = 2 mm



min nhits = 15
Edep = 0.5 MeV
DistXY = 8 mm



BACKUP SLIDES

MINIMUM NUMBER OF HITS = 5 HITS
MINIMUM ENERGY DEPOSIT = 0.5 MEV

Using only imaging layers

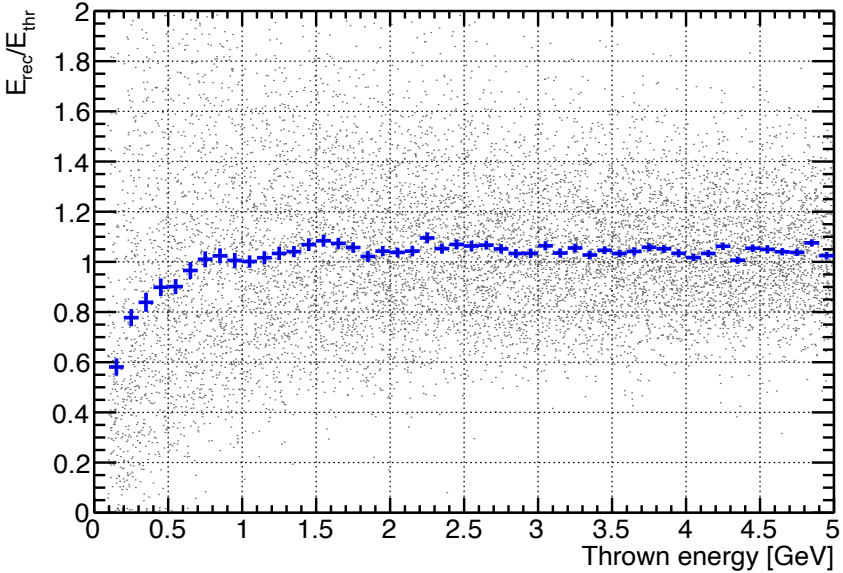
Cuts on clustering algorithm
- Min nhits = 5 hits
- Min cluster edep = 0.5 MeV

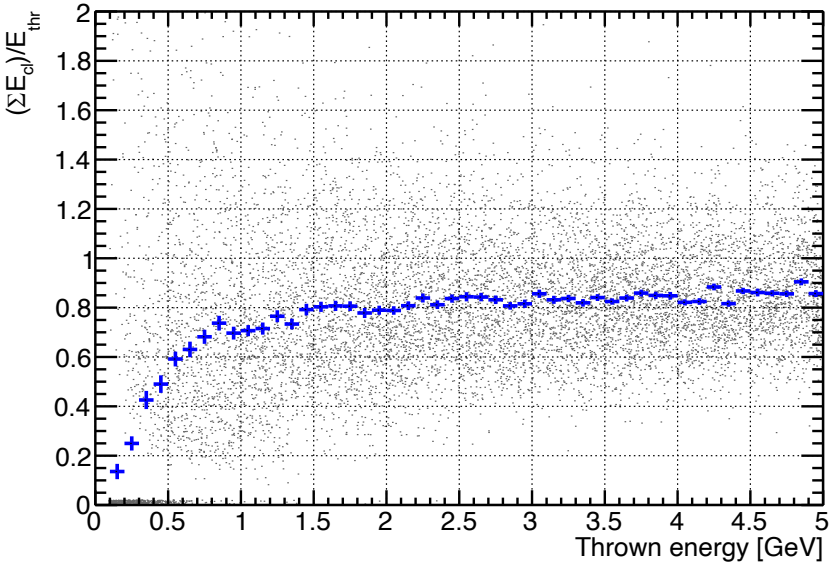
ENERGY RATIO VS THROWN ENERGY

Before Clustering $\frac{E_{rec}}{E_{thr}}$

After Clustering $\frac{\Sigma E_{cluster}}{E_{thr}}$

here E_{rec} and $E_{cluster}$ already applied sampling fraction (0.7%)





Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 5 hits
- Min cluster edep = 0.5 MeV

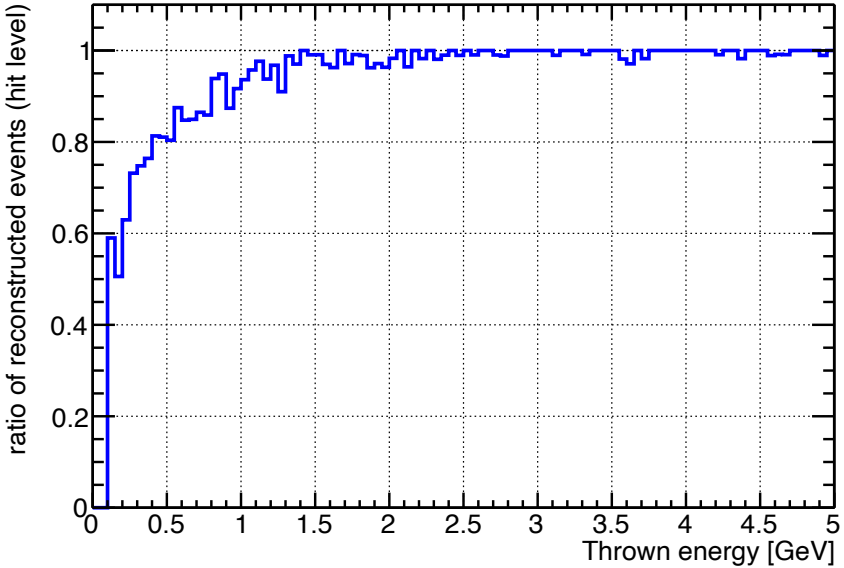
RATIO OF RECONSTRUCTED EVENTS

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}

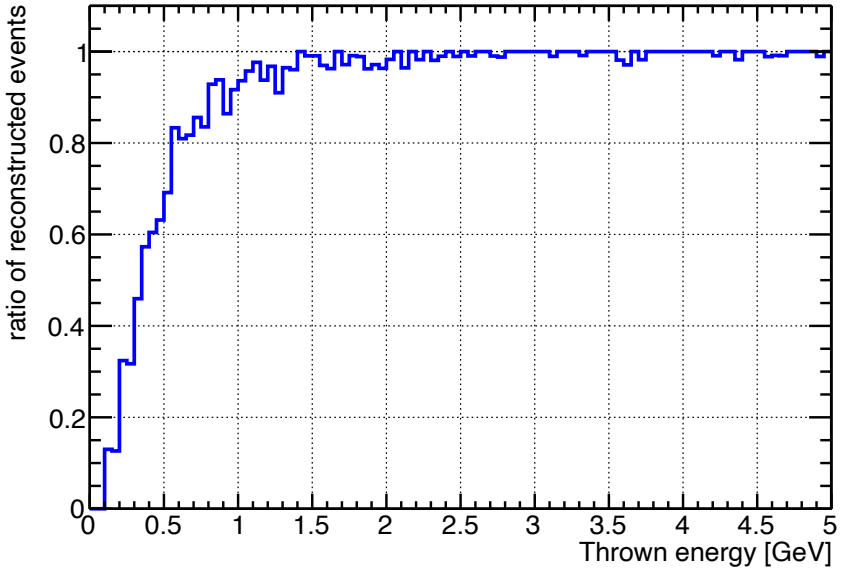
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 5 hits
- Min cluster edep = 0.5 MeV

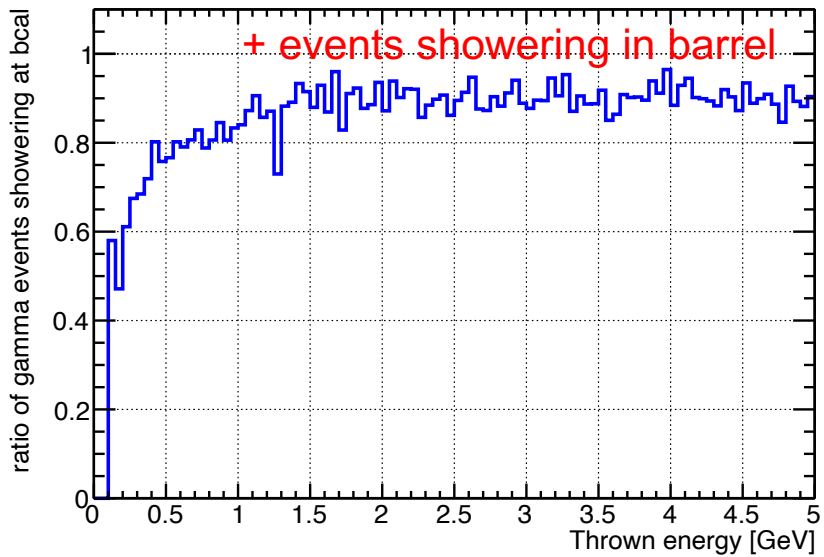
GAMMA SHOWERING AT BARREL

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}
+ events showering in barrel

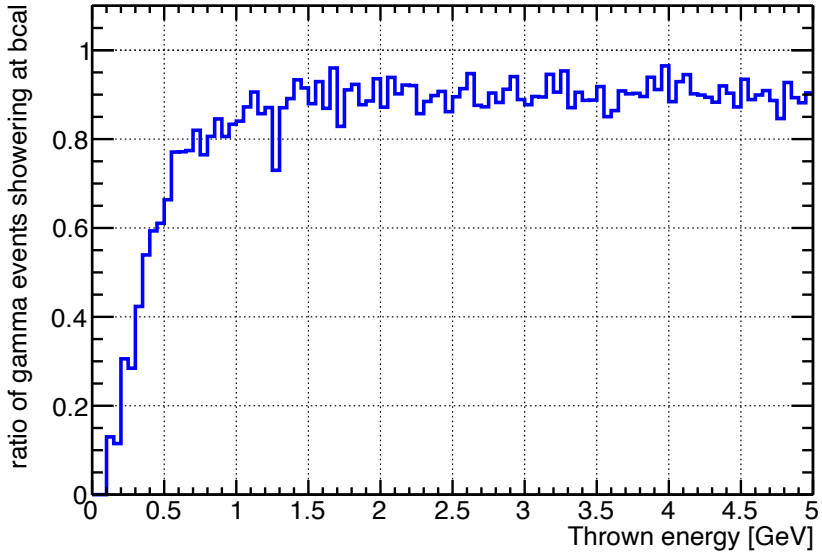
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 5 hits
- Min cluster edep = 0.5 MeV

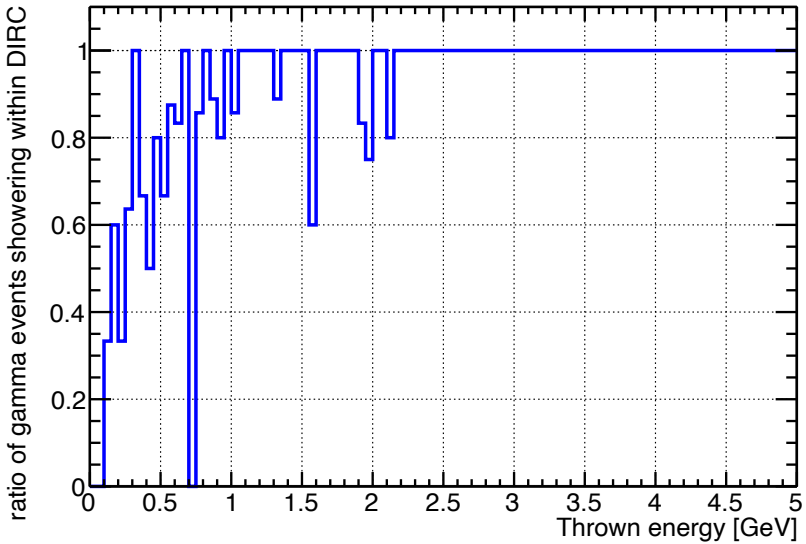
GAMMA SHOWERING AT DIRC (2/2)

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events\ showering\ at\ DIRC}$

+ events showering in DIRC

Before Clustering

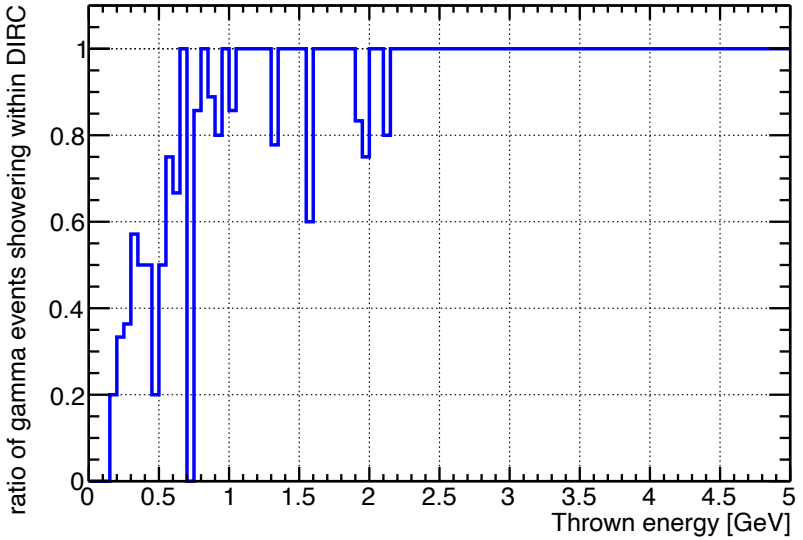
Cut on events' E_{rec} > 50% of E_{thr}



+ events' E_{rec} > 50% of E_{thr}
+ events showering in DIRC

After Clustering

Cut on events with at least 1 cluster



MINIMUM NUMBER OF HITS = 20 HITS
MINIMUM ENERGY DEPOSIT = 0.5 MEV

Using only imaging layers

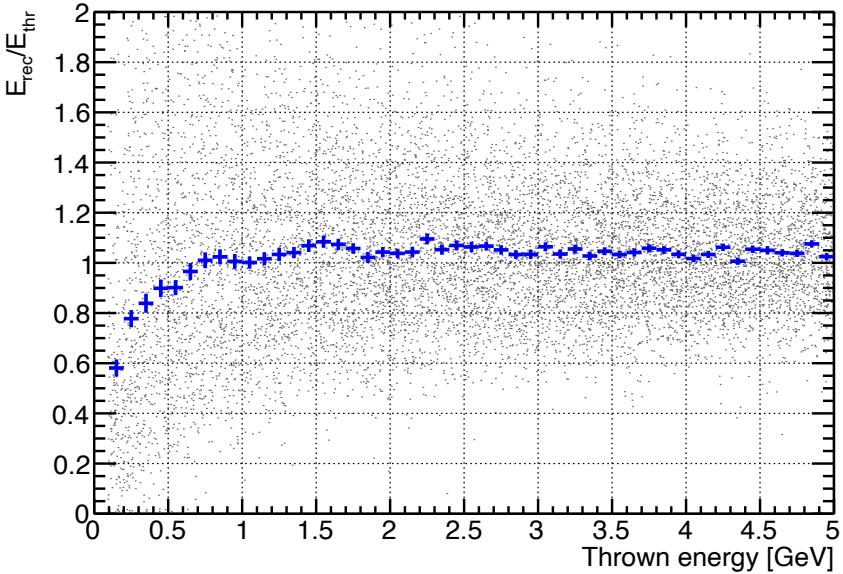
Cuts on clustering algorithm
- Min nhits = 20 hits
- Min cluster edep = 0.5 MeV

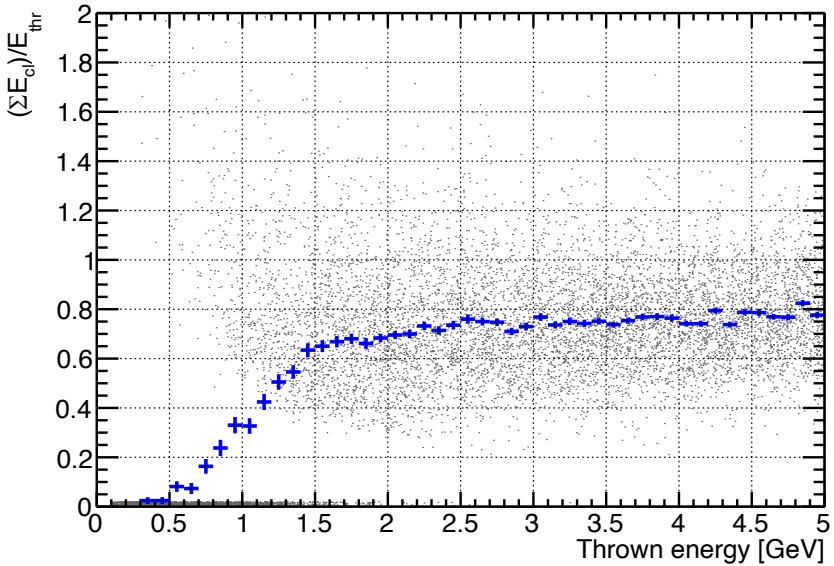
ENERGY RATIO VS THROWN ENERGY

Before Clustering $\frac{E_{rec}}{E_{thr}}$

After Clustering $\frac{\Sigma E_{cluster}}{E_{thr}}$

here E_{rec} and $E_{cluster}$ already applied sampling fraction (0.7%)





Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 20 hits
- Min cluster edep = 0.5 MeV

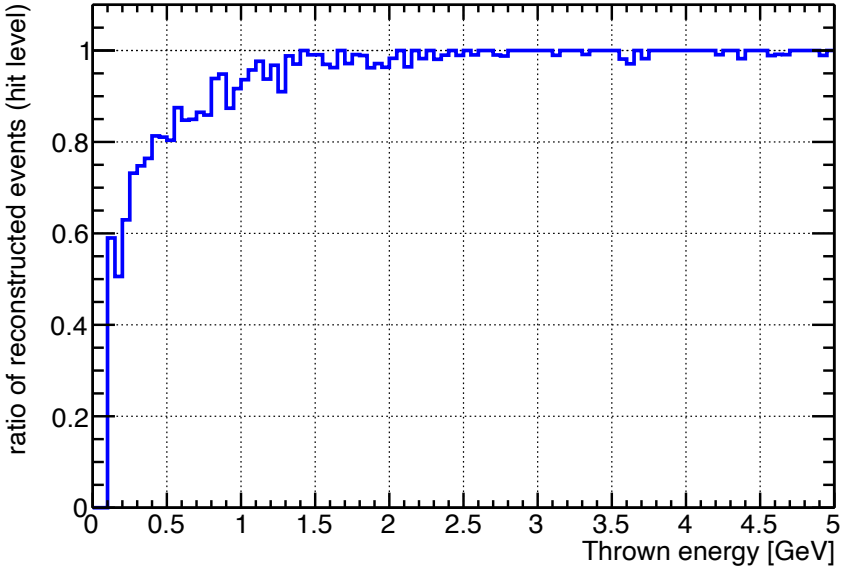
RATIO OF RECONSTRUCTED EVENTS

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}

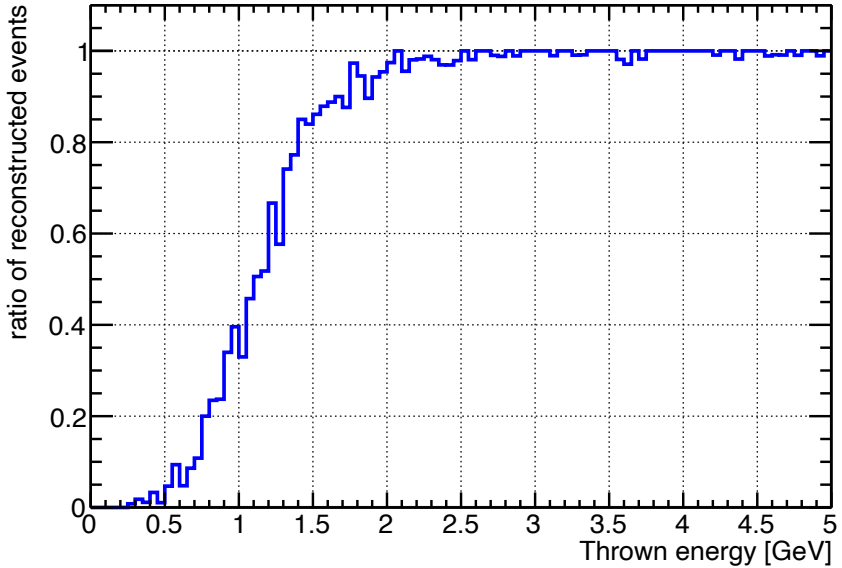
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 20 hits
- Min cluster edep = 0.5 MeV

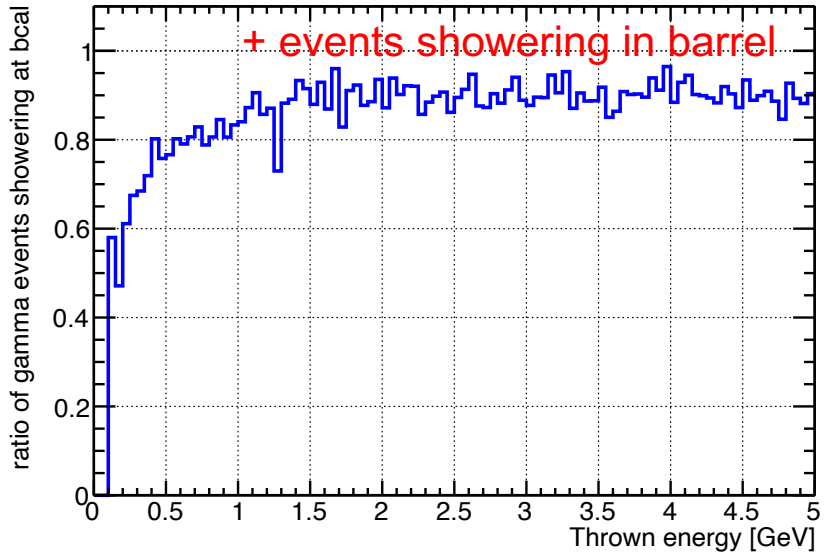
GAMMA SHOWERING AT BARREL

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}
+ events showering in barrel

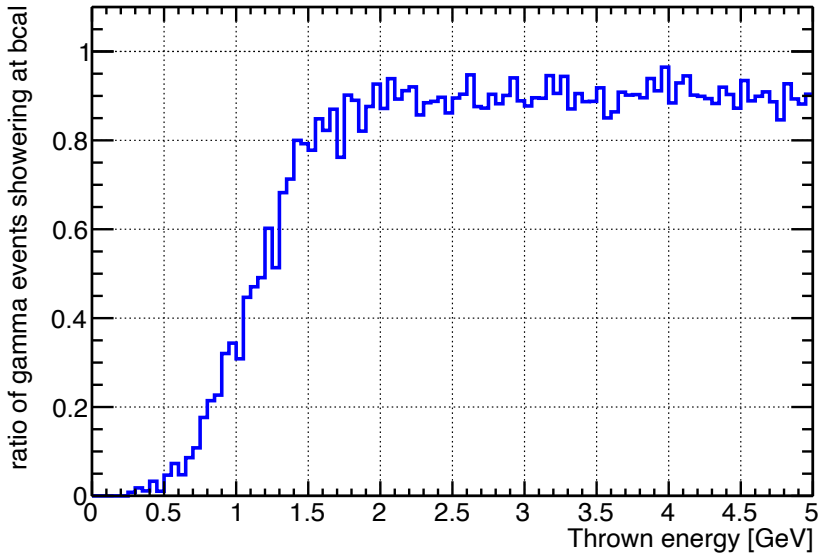
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 20 hits
- Min cluster edep = 0.5 MeV

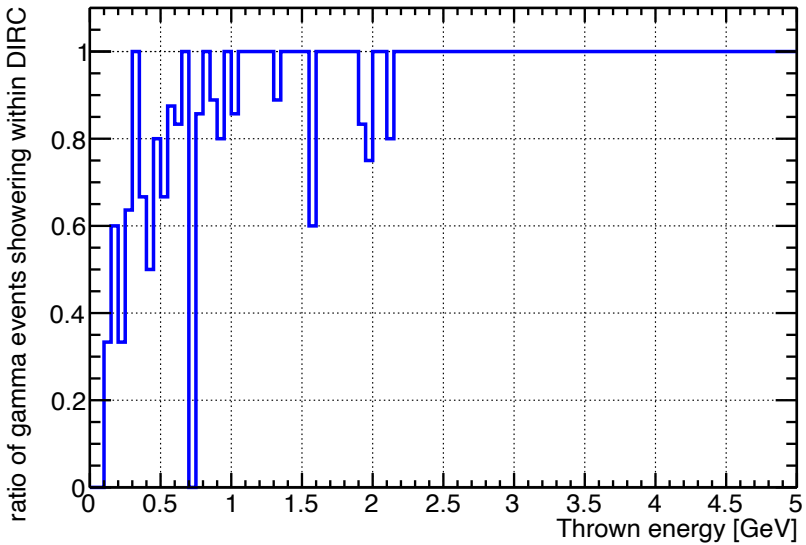
GAMMA SHOWERING AT DIRC (2/2)

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events\ showering\ at\ DIRC}$

+ events showering in DIRC

Before Clustering

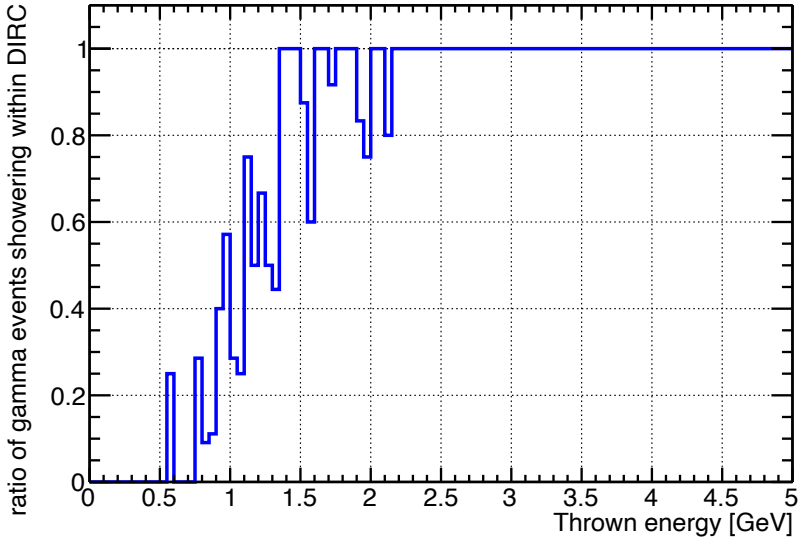
Cut on events' E_{rec} > 50% of E_{thr}



+ events' E_{rec} > 50% of E_{thr}
+ events showering in DIRC

After Clustering

Cut on events with at least 1 cluster



MINIMUM NUMBER OF HITS = 15 HITS
MINIMUM ENERGY DEPOSIT = 10.0 MEV

Using only imaging layers

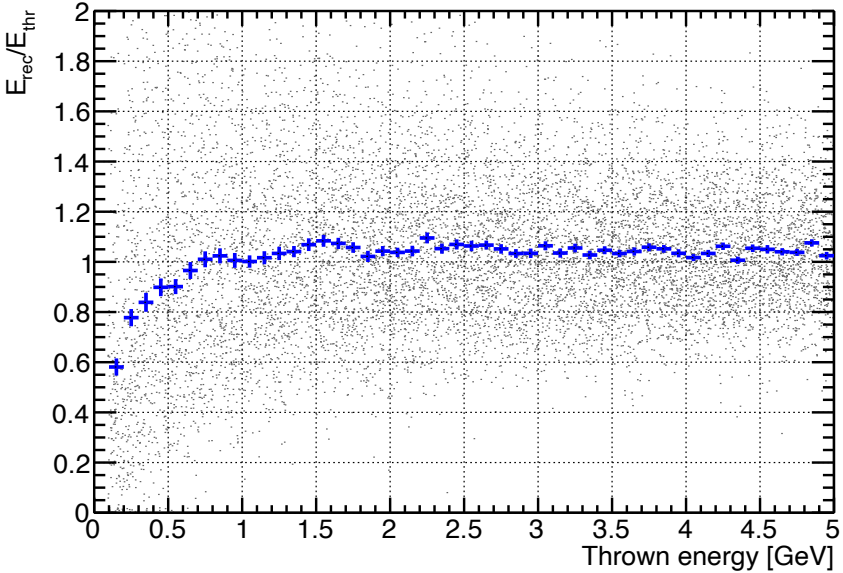
Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 10.0 MeV

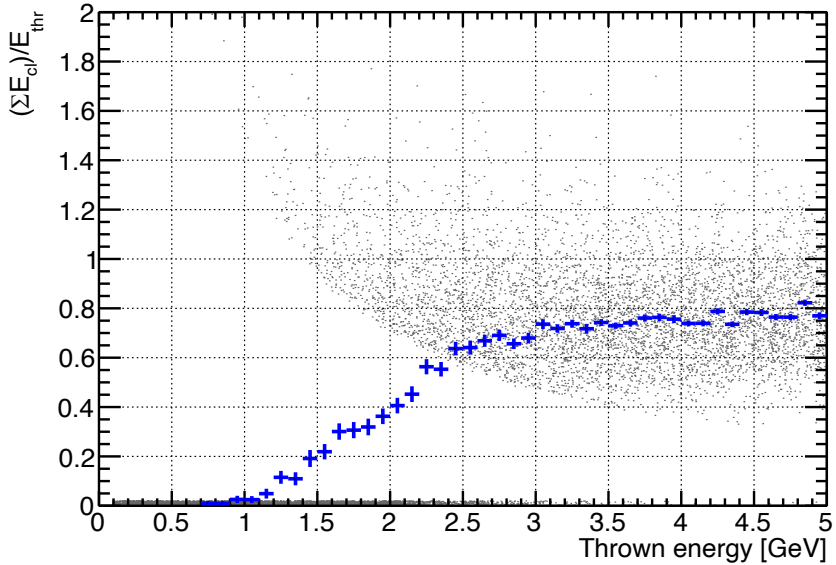
ENERGY RATIO VS THROWN ENERGY

Before Clustering $\frac{E_{rec}}{E_{thr}}$

After Clustering $\frac{\Sigma E_{cluster}}{E_{thr}}$

here E_{rec} and $E_{cluster}$ already applied sampling fraction (0.7%)





Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 10.0 MeV

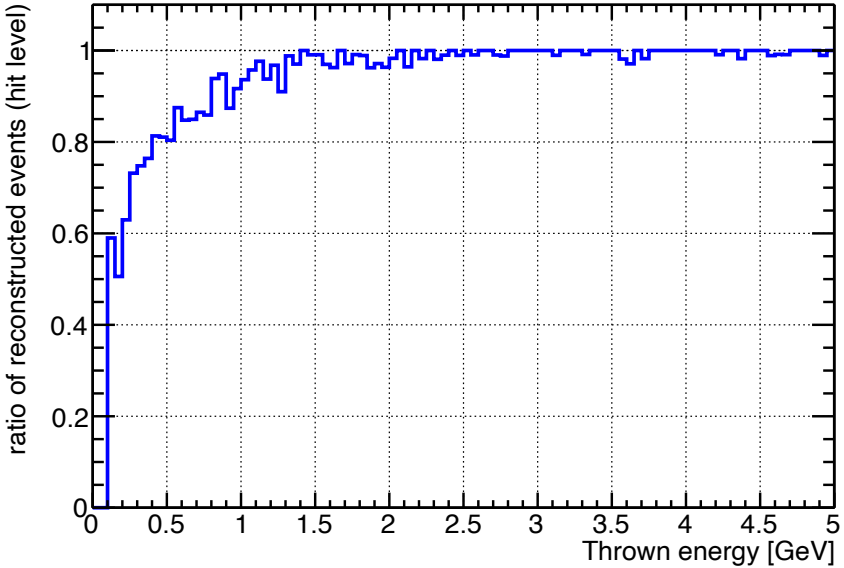
RATIO OF RECONSTRUCTED EVENTS

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}

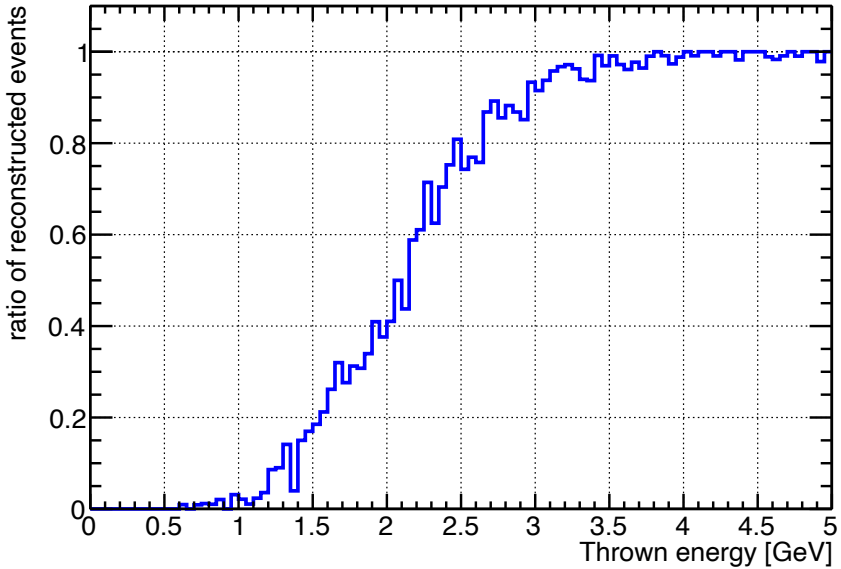
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 10.0 MeV

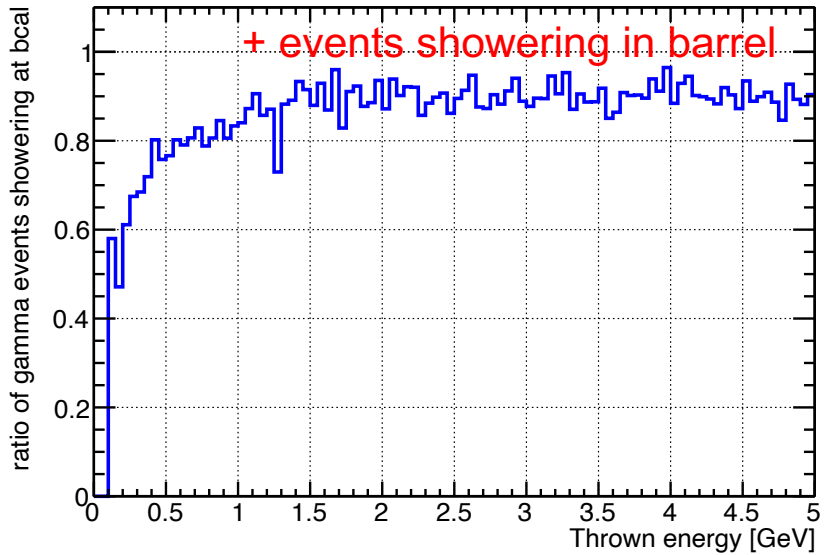
GAMMA SHOWERING AT BARREL

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events}$

+ events' E_{rec} > 50% of E_{thr}
+ events showering in barrel

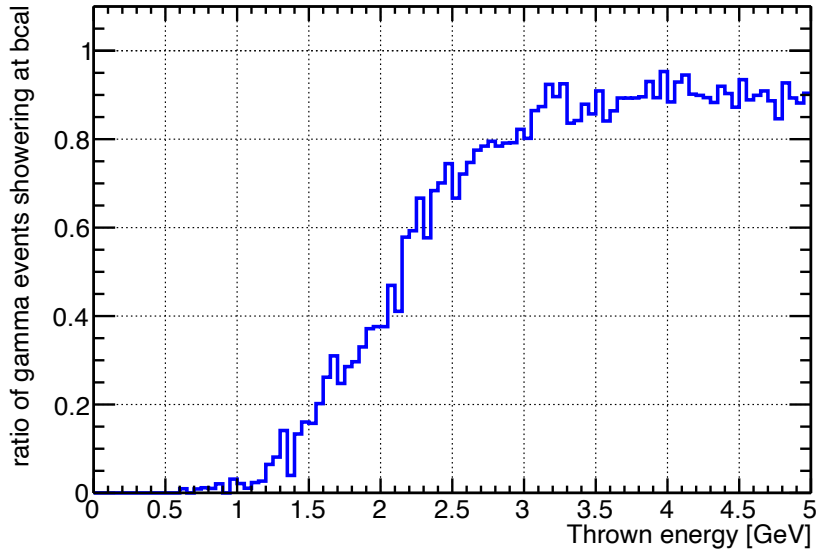
Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



After Clustering

Cut on events with at least 1 cluster



Using only imaging layers

Cuts on clustering algorithm
- Min nhits = 15 hits
- Min cluster edep = 10.0 MeV

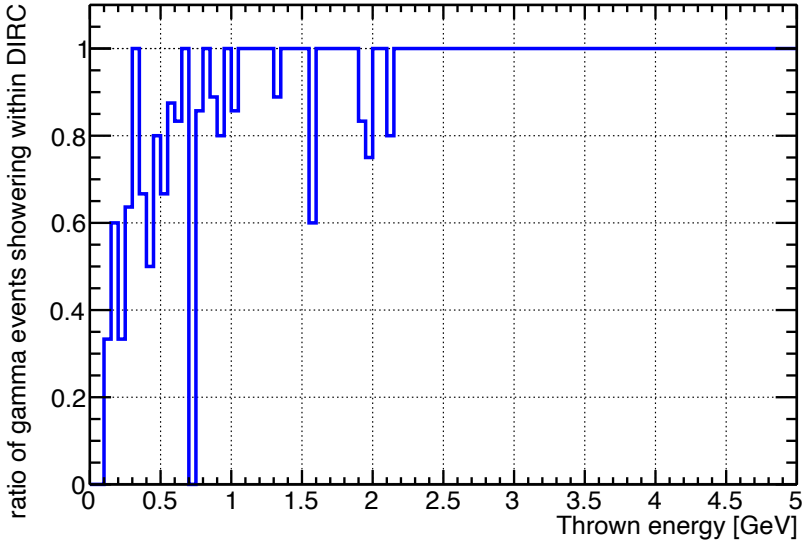
GAMMA SHOWERING AT DIRC (2/2)

Histogram of $\frac{\#\ of\ reconstructed\ events}{\#\ of\ thrown\ events\ showering\ at\ DIRC}$

+ events showering in DIRC

Before Clustering

Cut on events' E_{rec} > 50% of E_{thr}



+ events' E_{rec} > 50% of E_{thr}
+ events showering in DIRC

After Clustering

Cut on events with at least 1 cluster