Goal: Improve background rejection by using detailed CAL information

Hadronic Backgrounds tend to be messy in the CAL.

- Due to long interaction length relative to radiation length, entering hadrons tend to leave a trail of "MIP" Xtals

- Often secondary hadronic interactions cause disjoint energy clusters

E&M Showers tend to be compact.
Example of Multiple Clusters

Entering 5 GeV Proton
Example of "MIP" Xtals

Entering 5 GeV Proton
Several More Examples
Clusters

Uses:

- Background Rejection

- Multiple gamma events
  - $\pi^0$ in ground LAT cosmic ray test

- Better shape analysis
  - moments for each cluster
  - Shape categorization?
MIPS

Uses:

- Background rejection
  How often as a function of energy will a gamma produce a "MIP" trail of at least 3 layers (Xtals?)?

- Inter-alignment with Tracker

Strategy:

Use layer energy as a measure of path length in that layer (all layers should be ~ equal)
Use energy locations to fit a line