Preliminary Look at Cosmic Muon MC Events

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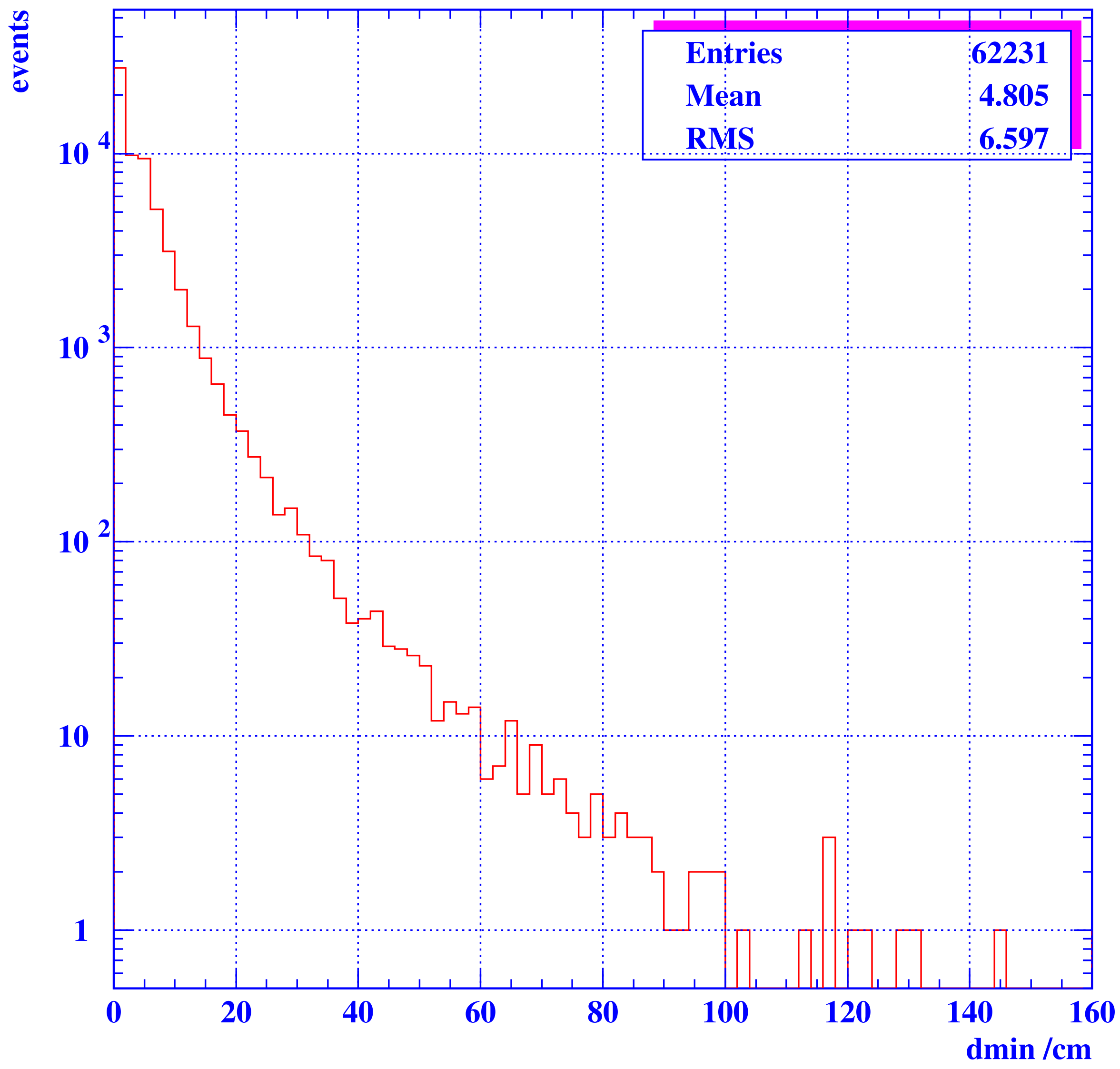
- Use flux file of downward going muons from Jim Musser
- Generated 105k events incident on detector (box 470*470*3400 cm)
- Look at true hits in detector, with no energy threshold
- Only consider events with hits in at least 4 planes
  59% of total
- Find hit closest to edge of 8m diameter octagon

Cosmic Muons

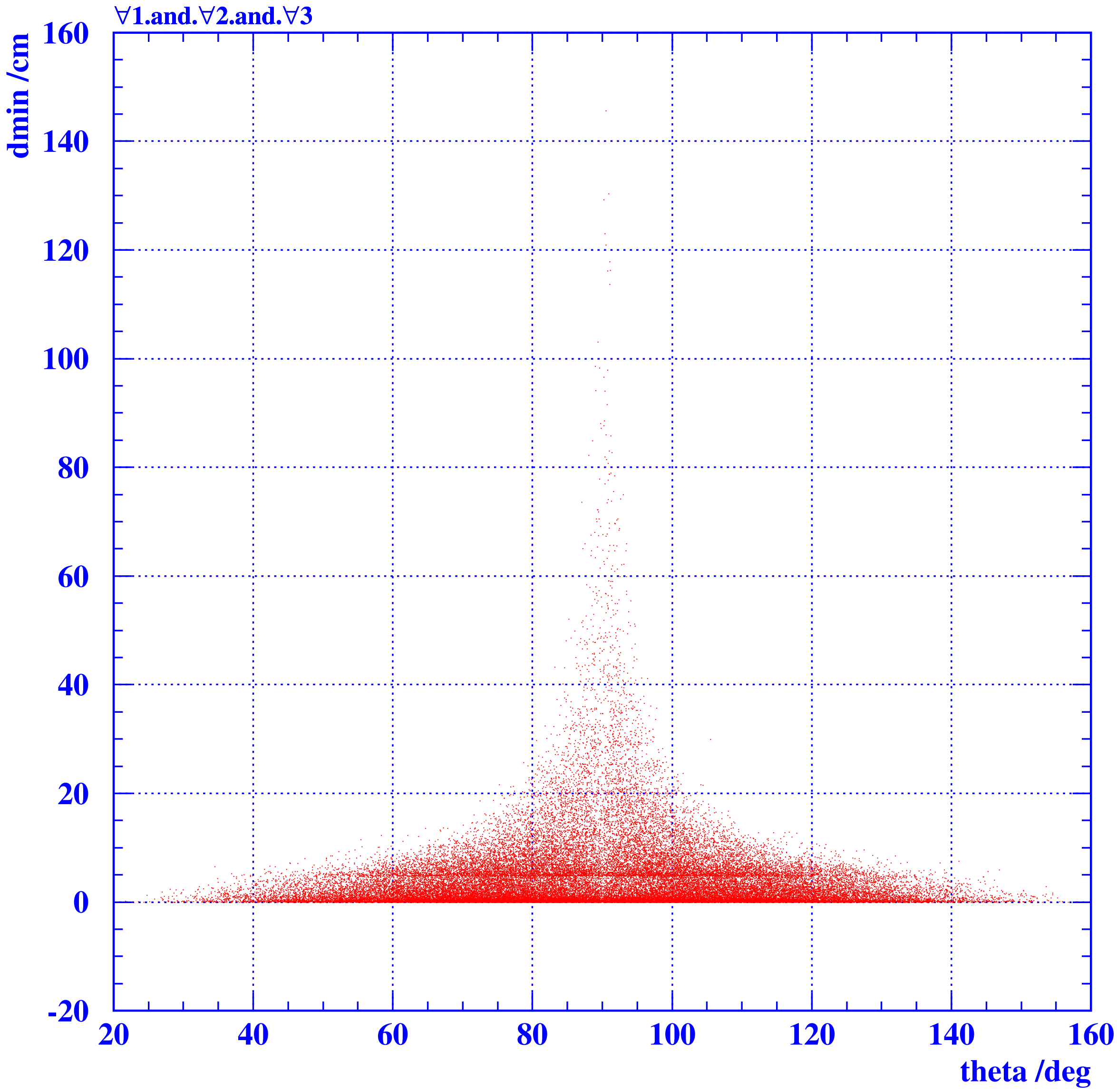
- Distribution of minimum distance to edge of detector, for events with hits in at least 4 planes:



- 172 events have dmin $>$ 50 cm; of these, 18 have a hit in the first or last plane of a supermodule $\rightarrow$ 154 events classified as contained (0.15% of total)

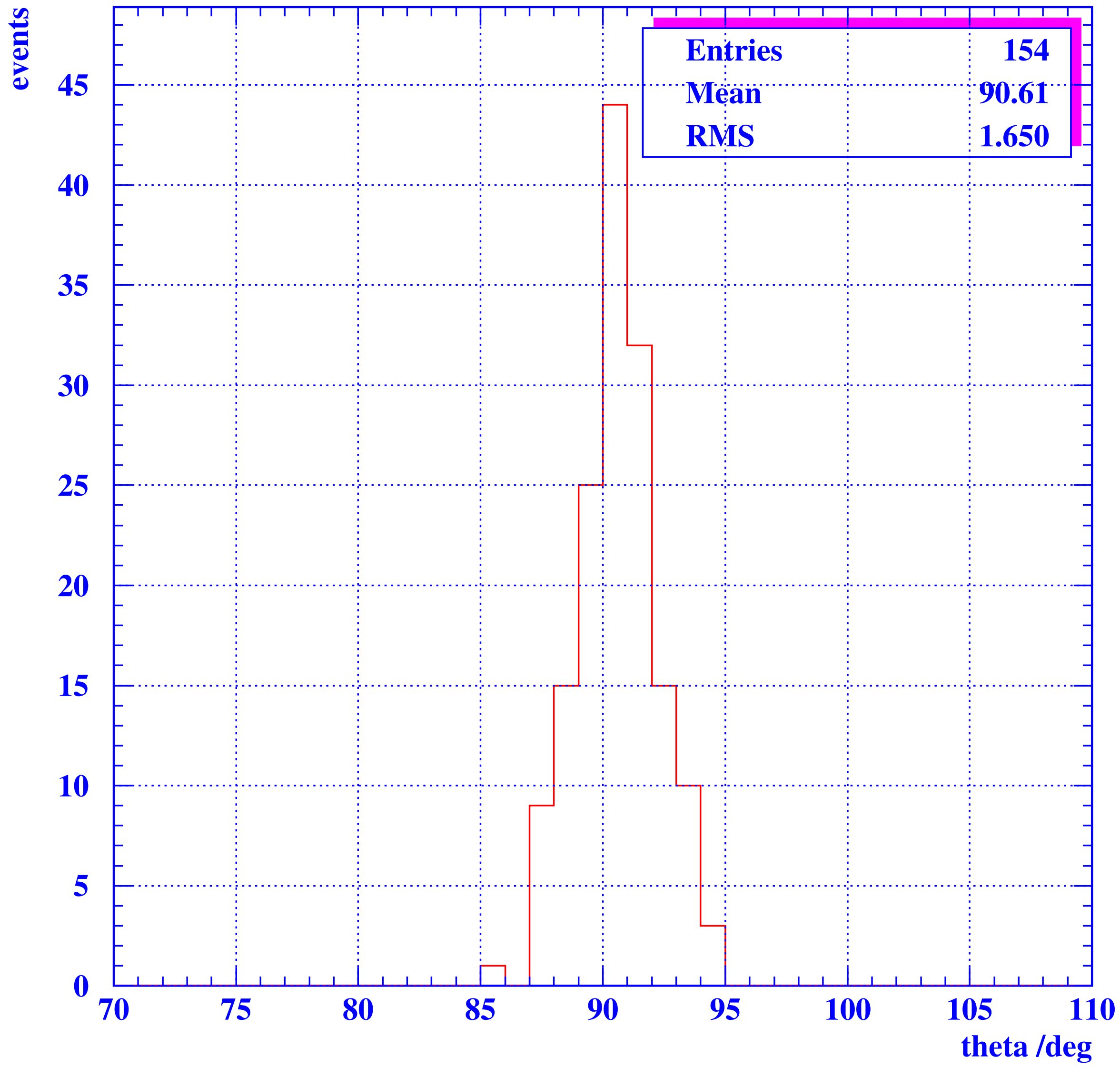
Cosmic Muons

- Plot minimum distance to edge v. angle wrt z axis of detector
  Events with hits in first or last plane of each supermodule removed
- Contained events within $\pm 10^\circ$ of 90° as expected



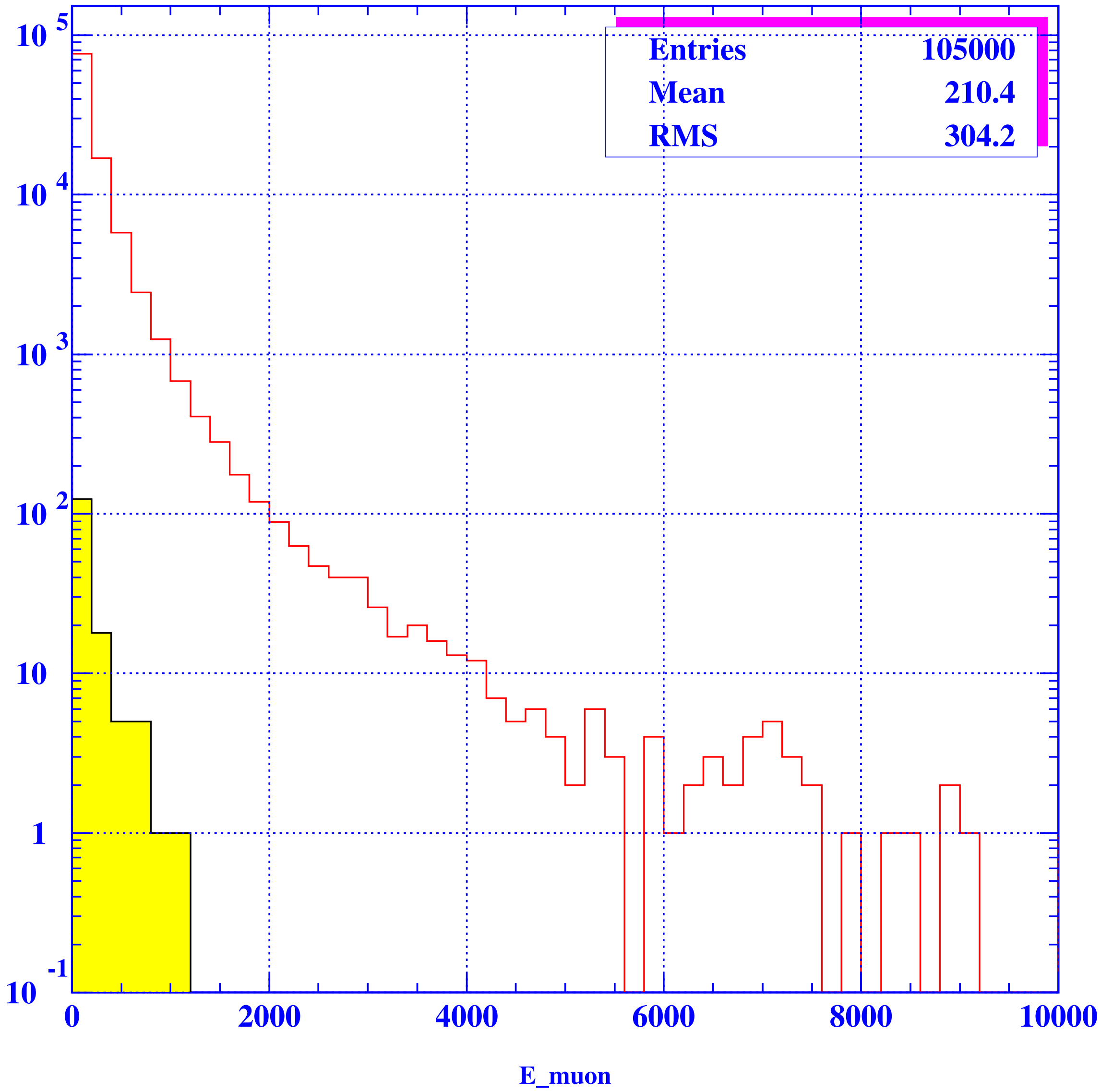
Cosmic Muons

- Theta distribution for the 154 contained events



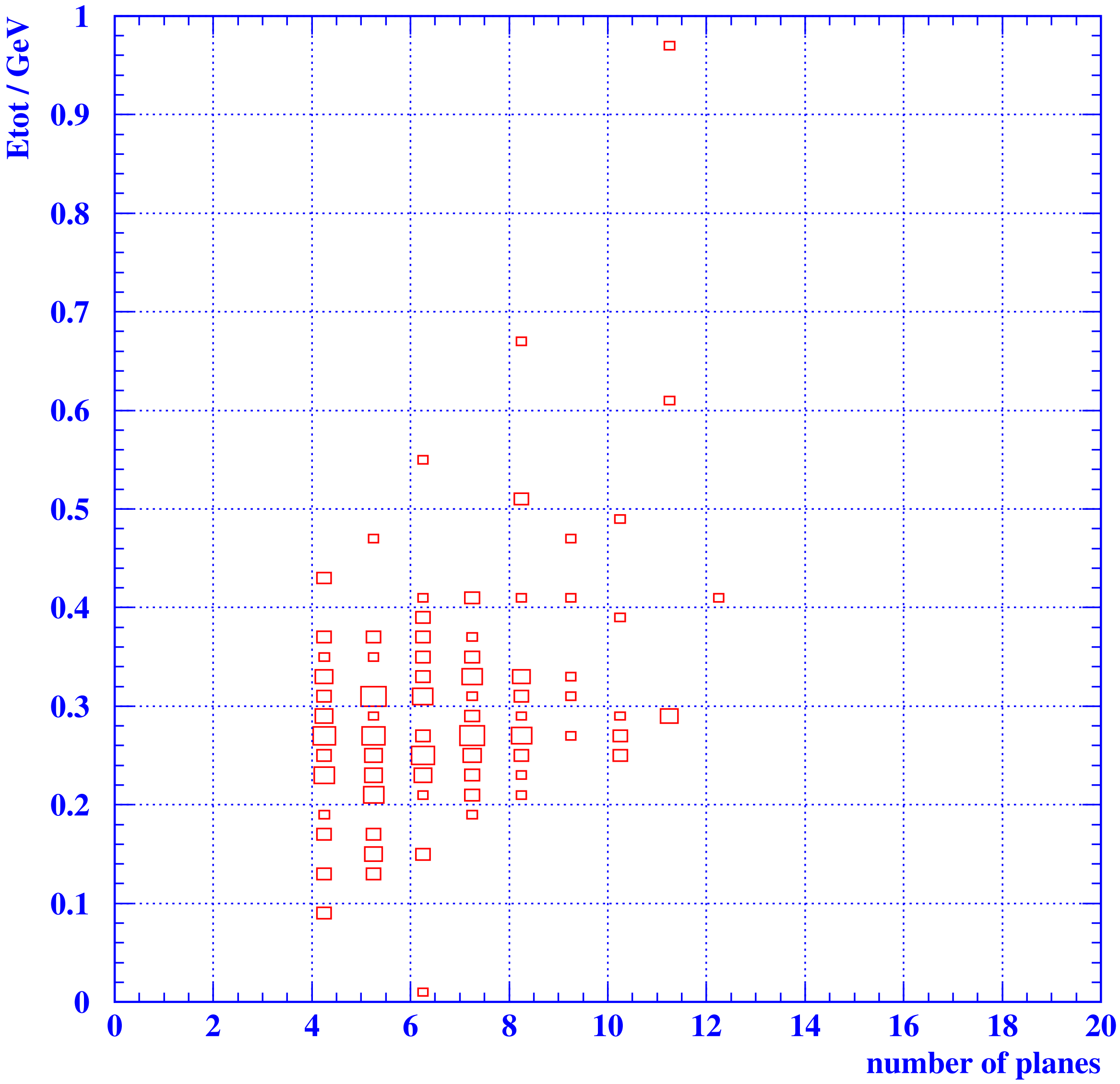
Cosmic Muons

- Muon momentum distribution (contained events shaded)

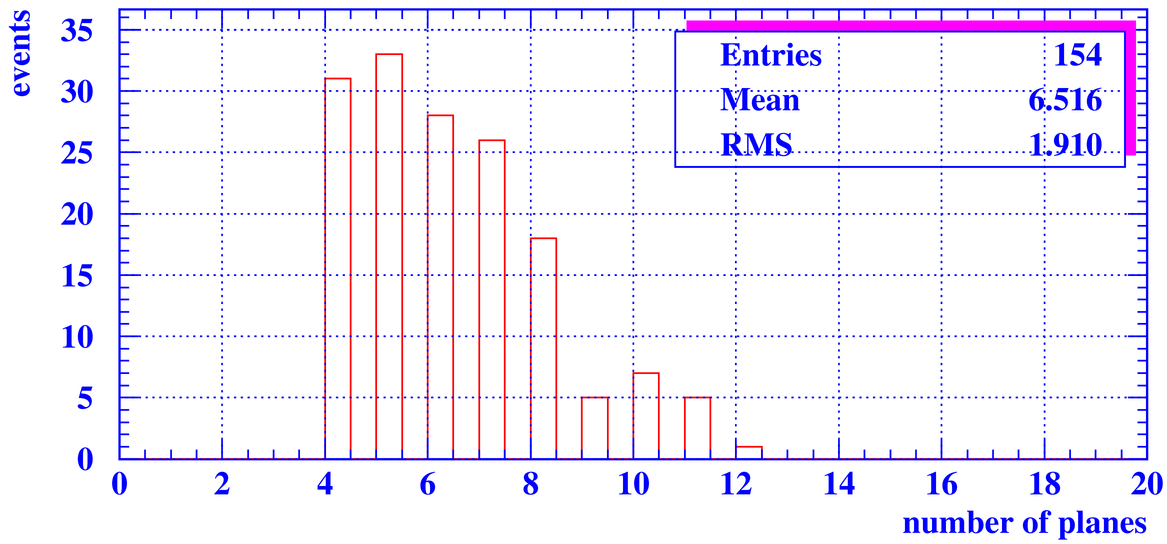


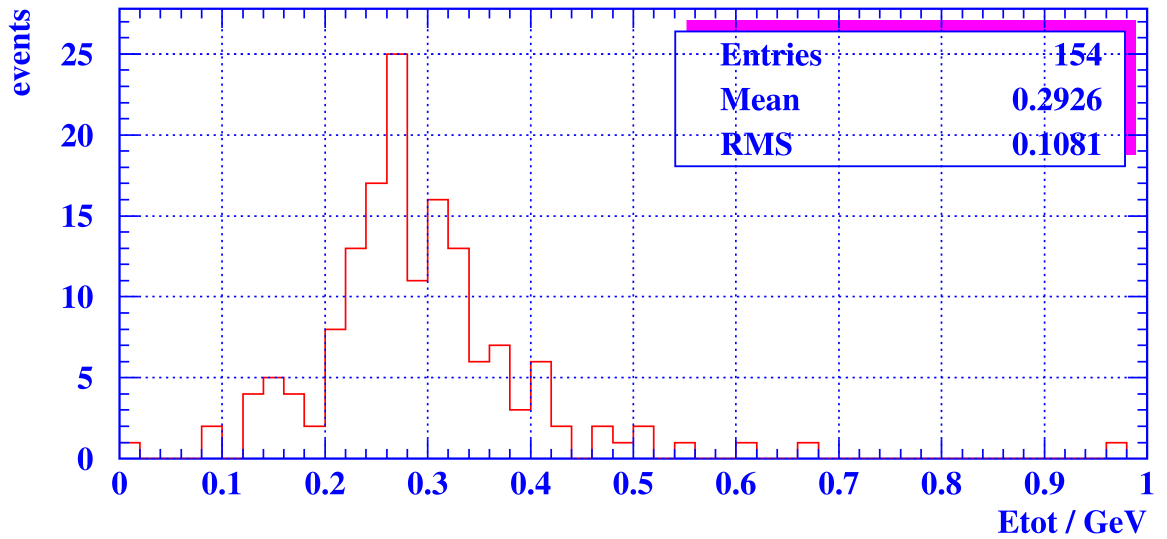
Cosmic Muons

- Total energy deposited v. number of planes with hits



Cosmic Muons





Cosmic Muons

Next steps

- Scan contained events: tracks or showers?
- Generate large samples, with theta cut
- Proper event reconstruction (Caius)