TPC BAD CHANNEL SEARCH UPDATE

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11.29.2007

HOT PADS SEARCH

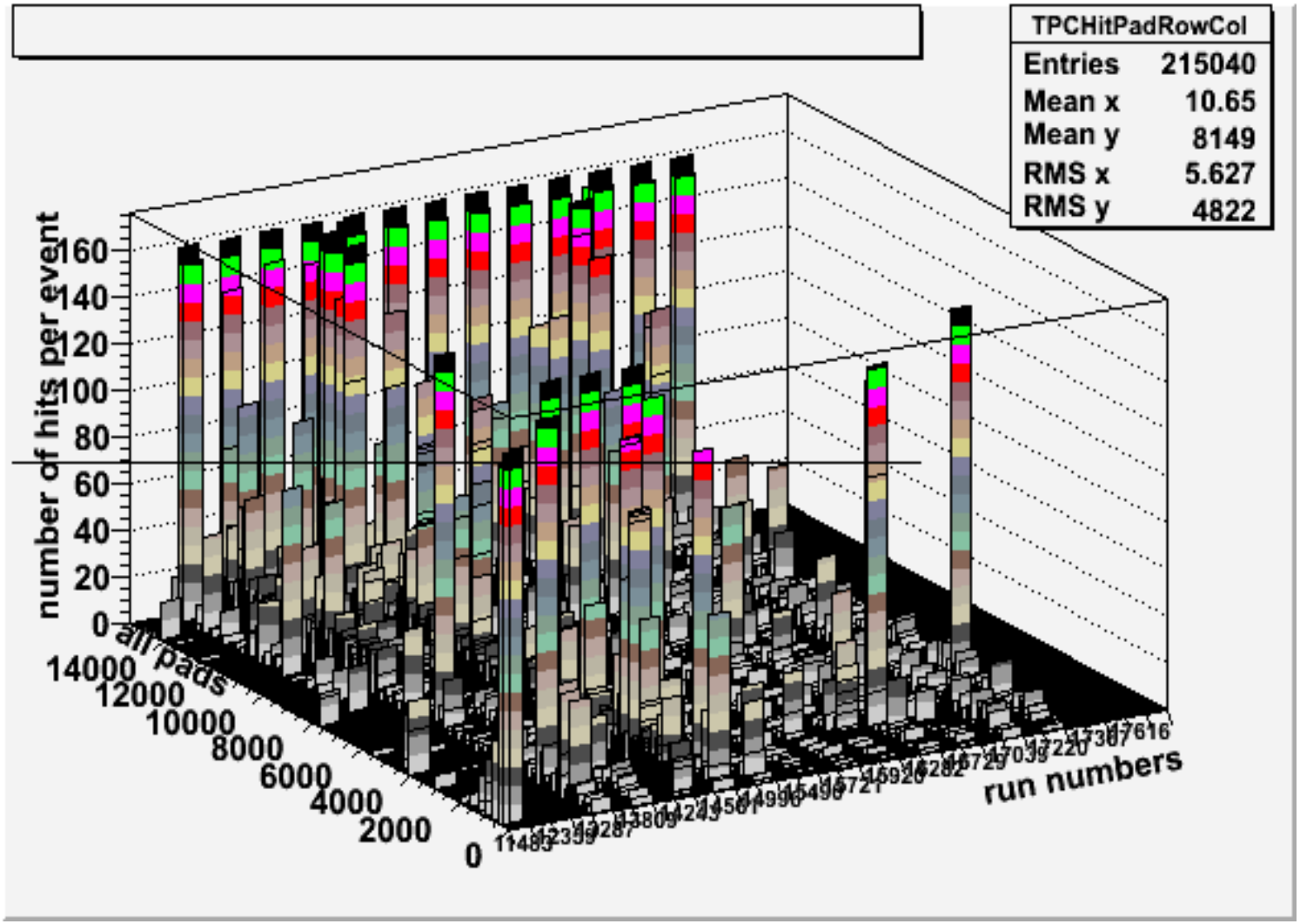
-14 Subruns were used from different dates ranging from 02/02/2005 to 01/07/2006 from different targets and beam energies

-Calibration (Inter-spill pulser) events were used to plot number of raw TPC digits per event for all 15360 pads

-The subruns used are:

run#	Energy	Target	Date
12018	35	Bismuth	02 February 2005
12359	58	Carbon	15 February 2005
13287	58	LH2	13 March 2005
13809	19.8	LH2	13 April 2005
14243	58	Bismuth	16 May 2005
14561	118	NuMI	19 June 2005
14996	118	NuMI	15 July 2005
15490	120	Carbon	10 August 2005
15721	120	Carbon	29 August 2005
15920	120	Bismuth	10 September 2005
16282	-59	LH2	16 October 2005
16729	20	LH2	06 November 2005
17039	-86	LH2	10 December 2005
17220	59	Bismuth	07 January 2006

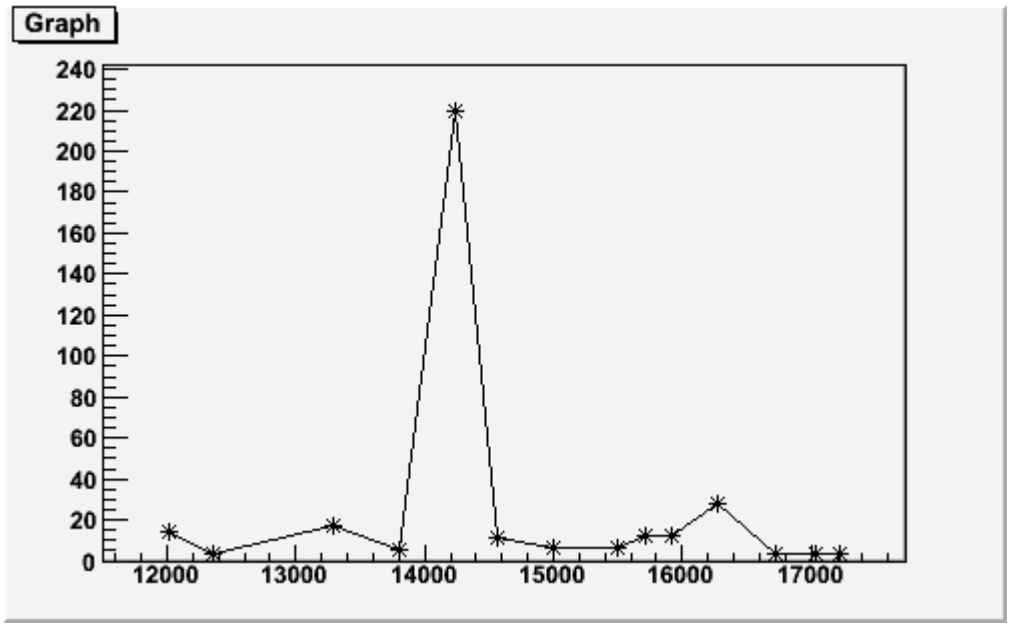
Hit Distributions for all pads and different runs



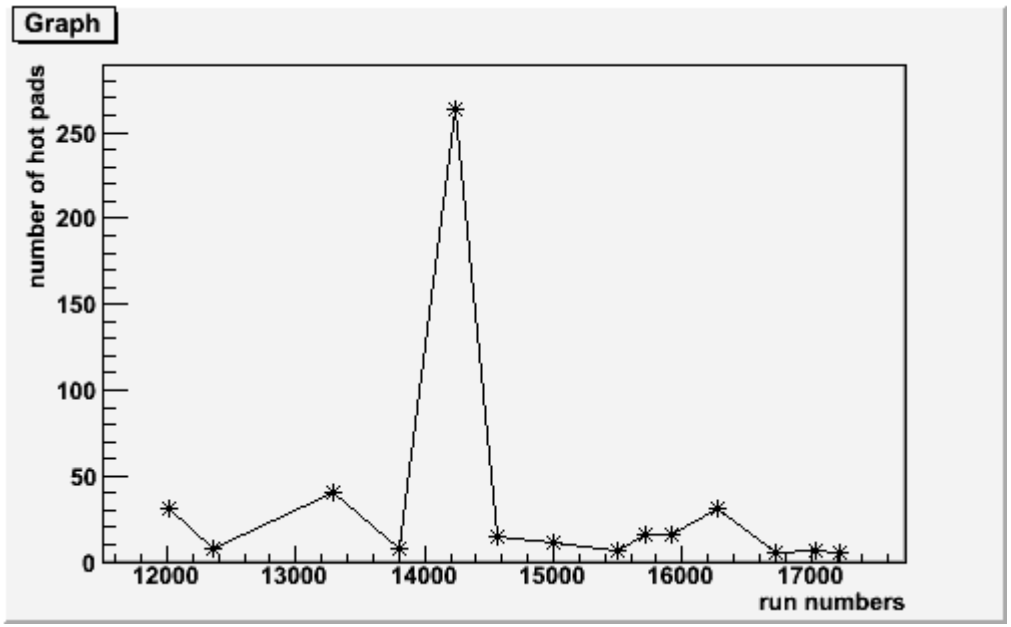
Some hot pads are the same for all runs but there are some hot pads differ from run to run. Also some runs have more hot pads.

Number of hot pads for different runs

Number of pads if number of hits per event for a given pad is above 40

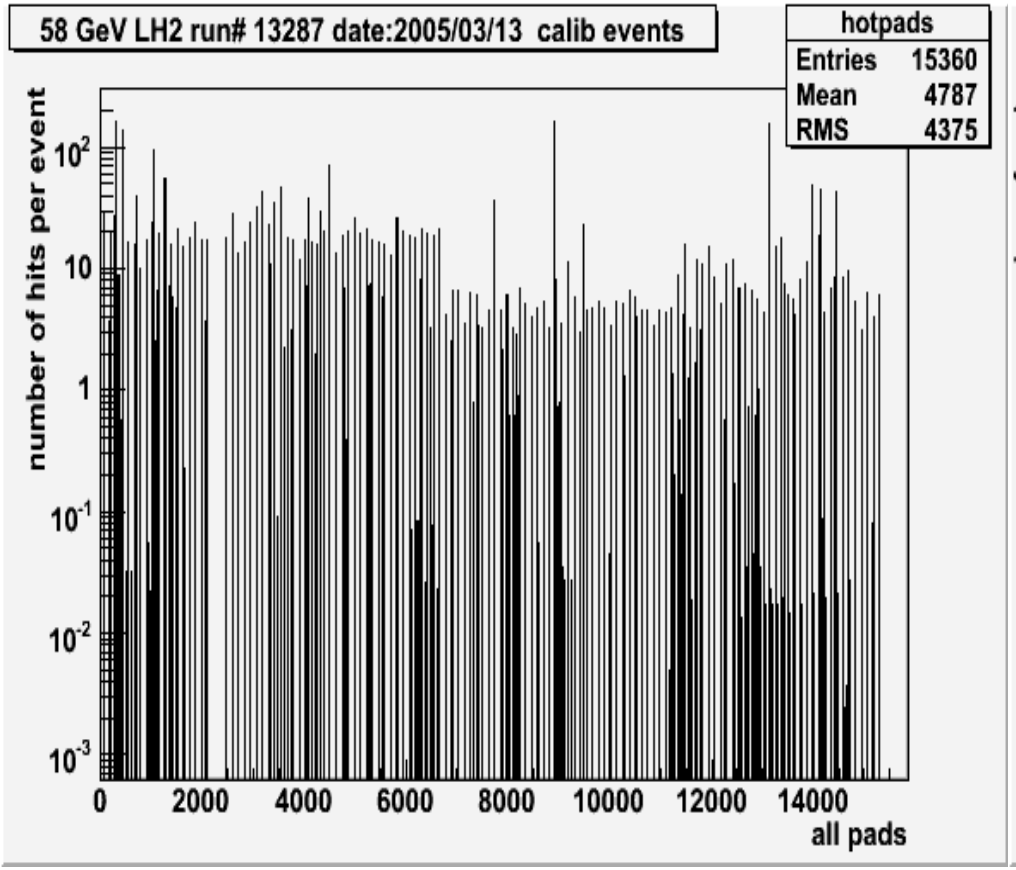


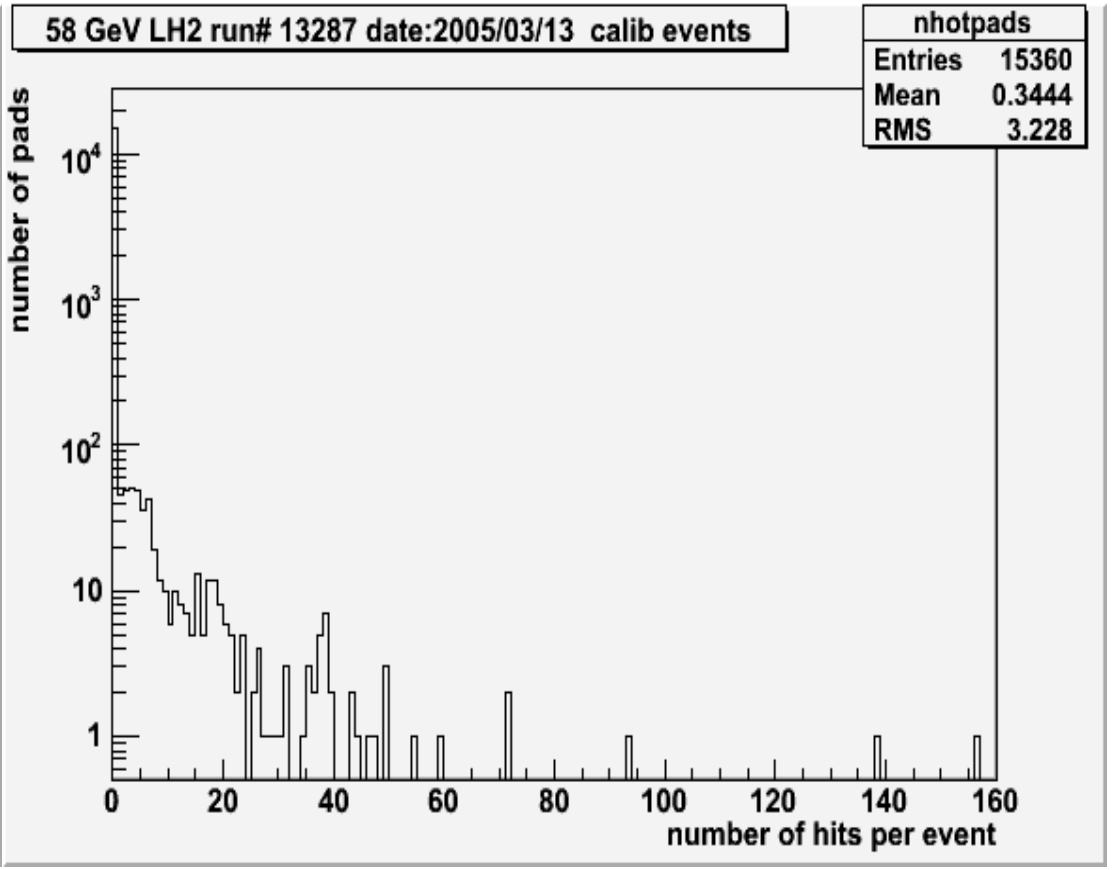
Cut is 30



The run 14243 has much more hot pads. The date of the run is May 2005 and it is 58 GeV/c Bismuth target. All other runs seems that have not so different amount of hot pads.

Hit Distribution for run 13287 Subrun 0





Number of pads above 40 hits per event: 17
Number of pads above 30 hits per event: 41
Number of pads above 25 hits per event: 50

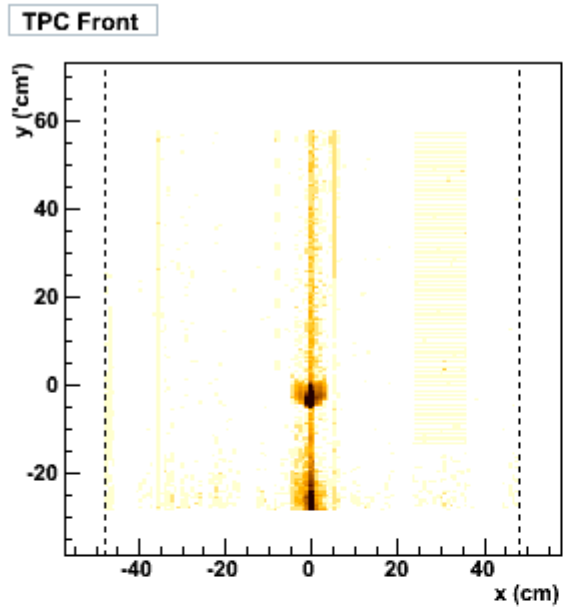
TPC DISPLAY SHOWING ALL RAW HITS for run 13287 EVENT 213

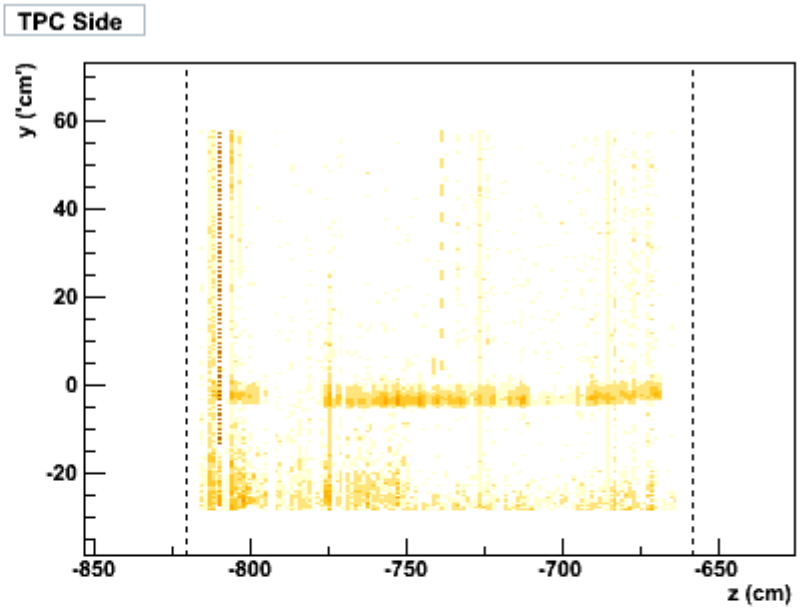
MIPP (FNAL E907)

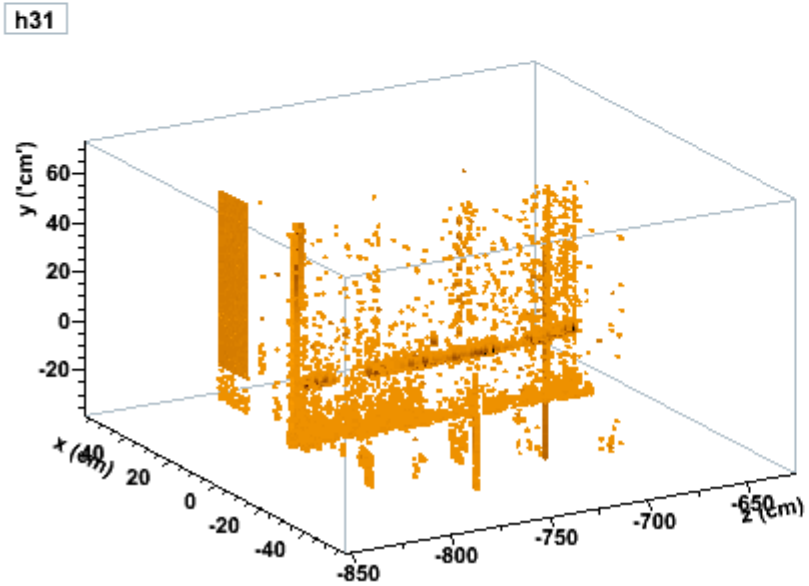
Mom.: 58 GeV/c
Target: LH2
Run: 13287
SubRun: 0
Event: 213

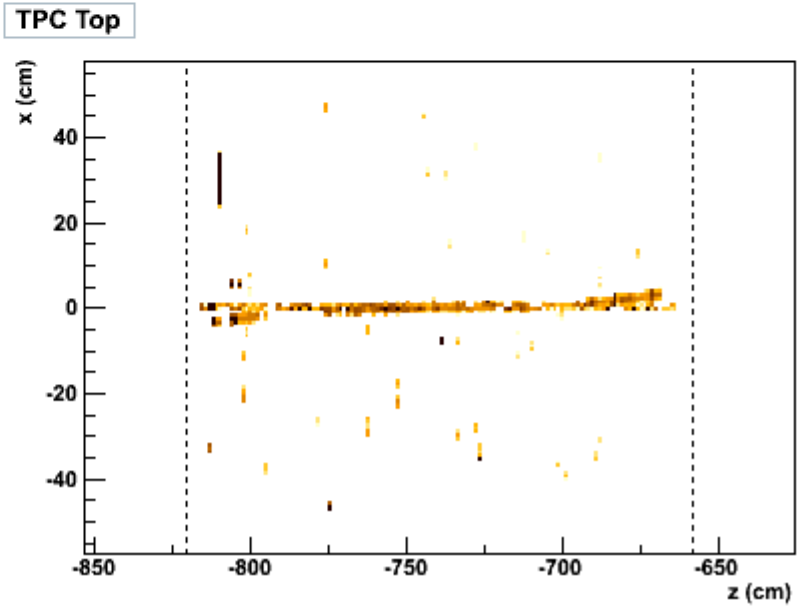
Sun Mar 13 2005
10:21:25.251253

*** Trigger ***
Beam
Word: 0040
Bits: 0047

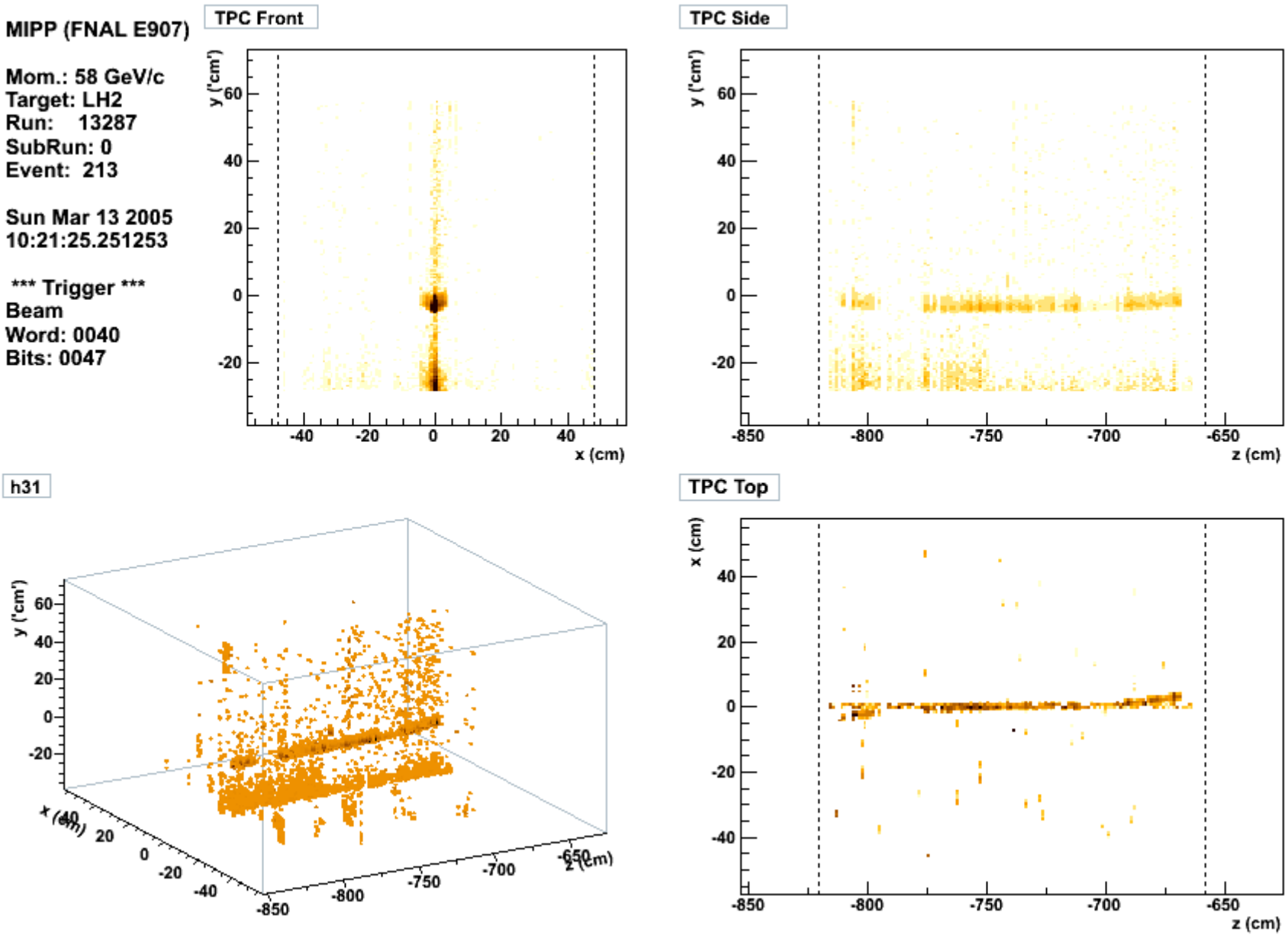








TPC DISPLAY AFTRE CUTTING PADS ABOVE 40 HITS for run 13287 event 213



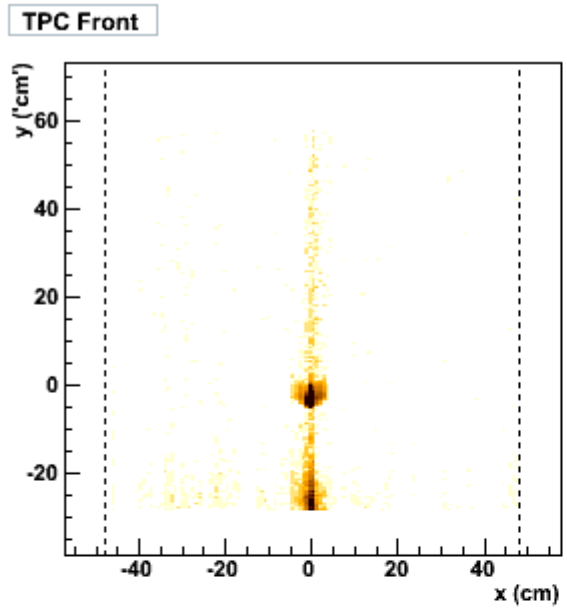
TPC DISPLAY AFTER CUTTING PADS ABOVE 30 HITS for run 13287 Event 213

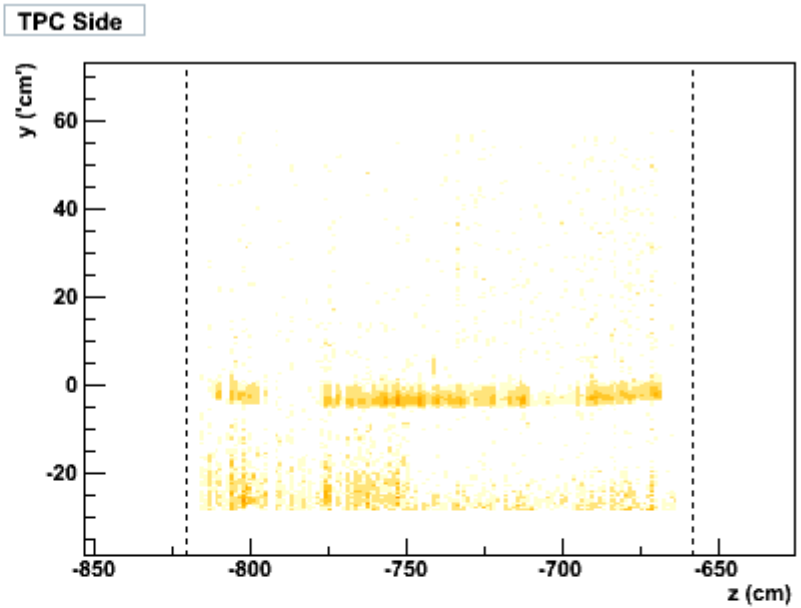
MIPP (FNAL E907)

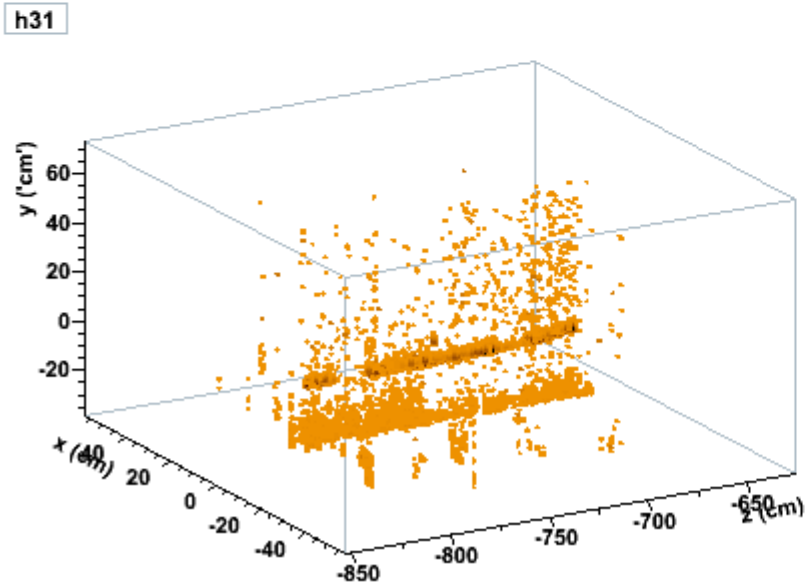
Mom.: 58 GeV/c
Target: LH2
Run: 13287
SubRun: 0
Event: 213

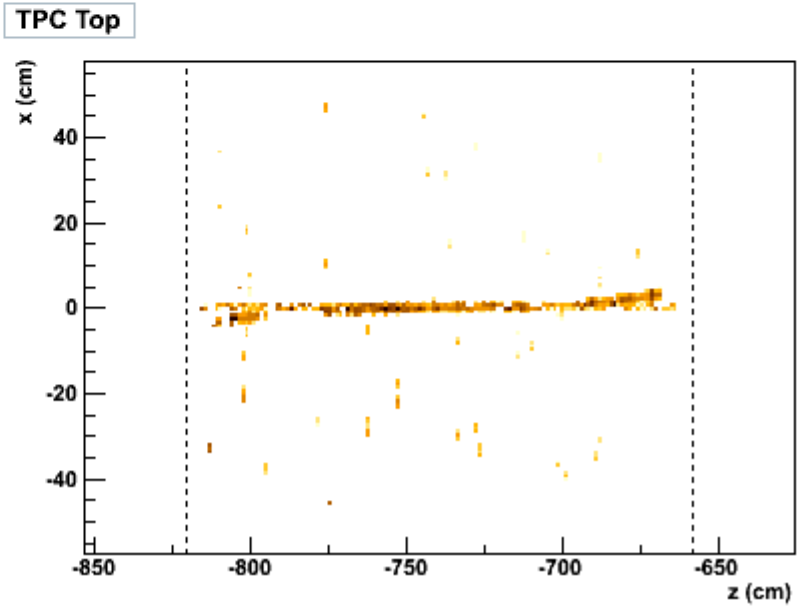
Sun Mar 13 2005
10:21:25.251253

*** Trigger ***
Beam
Word: 0040
Bits: 0047









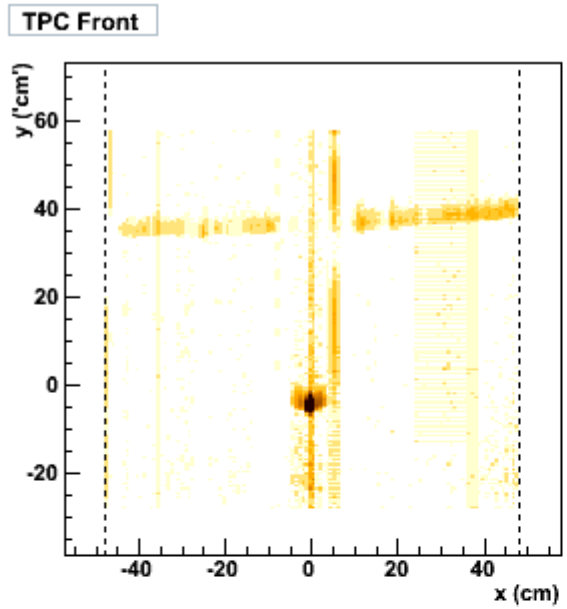
TPC DISPLAY SHOWING ALL RAW HITS FOR RUN 13287 EVENT 3113

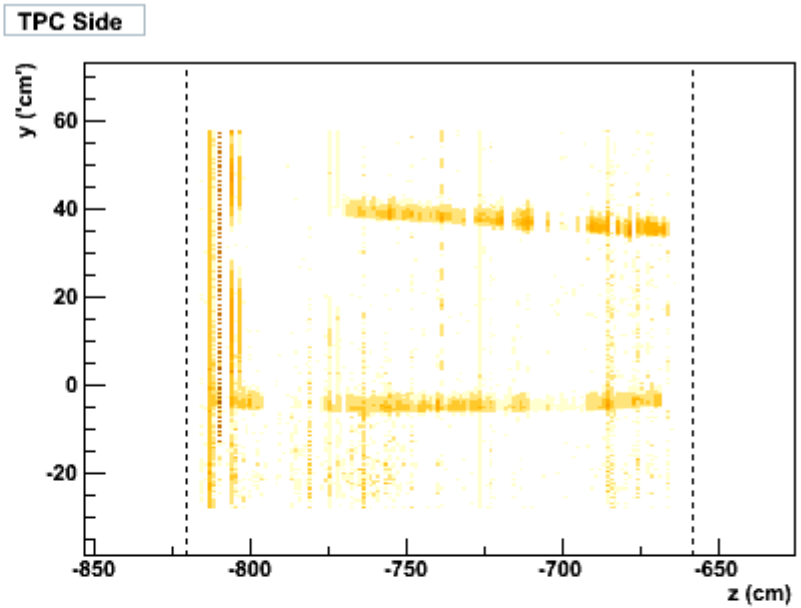
MIPP (FNAL E907)

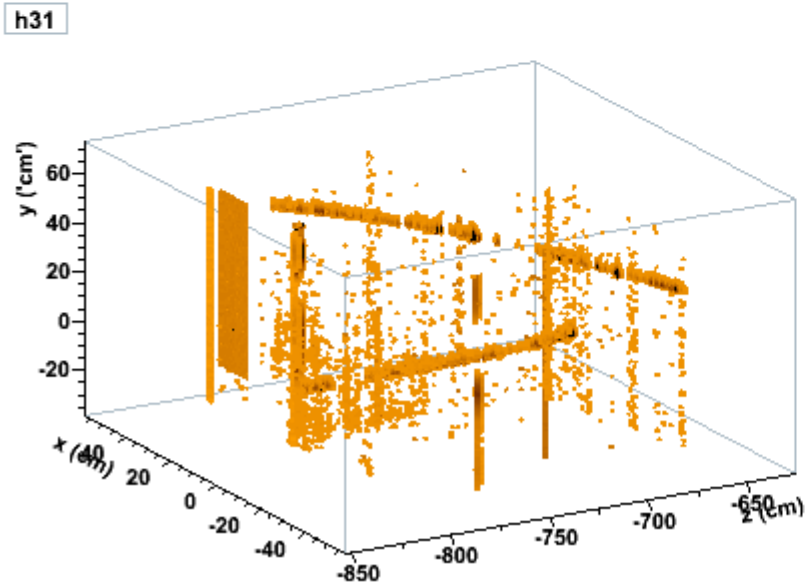
Mom.: 58 GeV/c
Target: LH2
Run: 13287
SubRun: 0
Event: 3113

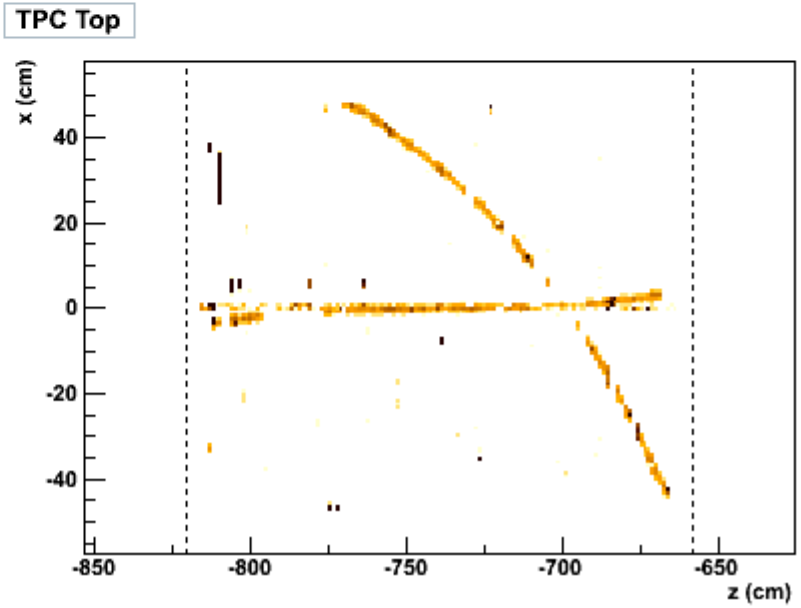
Sun Mar 13 2005
11:01:35.866739

*** Trigger ***
Beam
Word: 0001
Bits: 0007









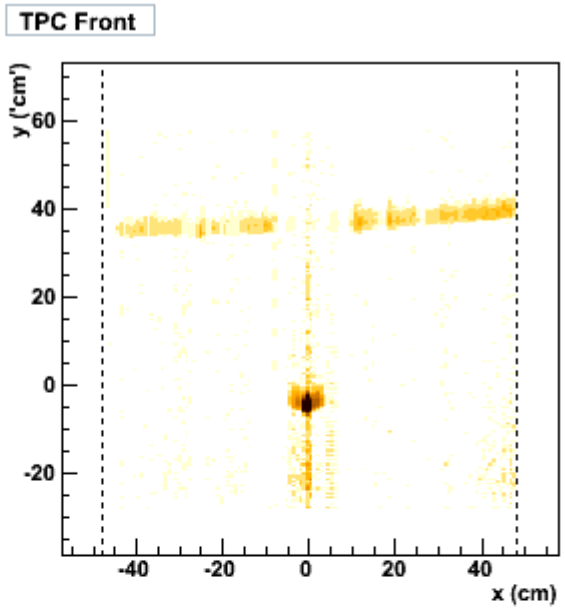
TPC DISPLAY AFTER CUTTING PADS ABOVE 40 HITS for run 13287 event 3113

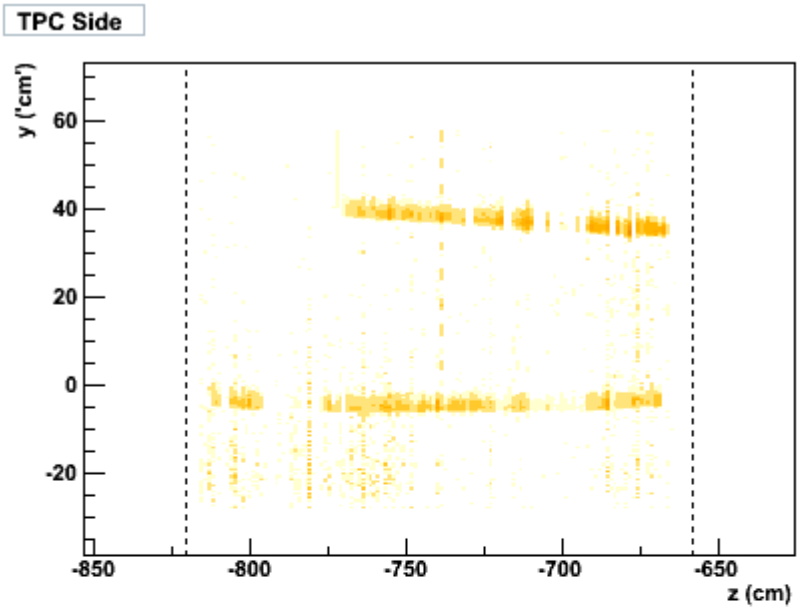
MIPP (FNAL E907)

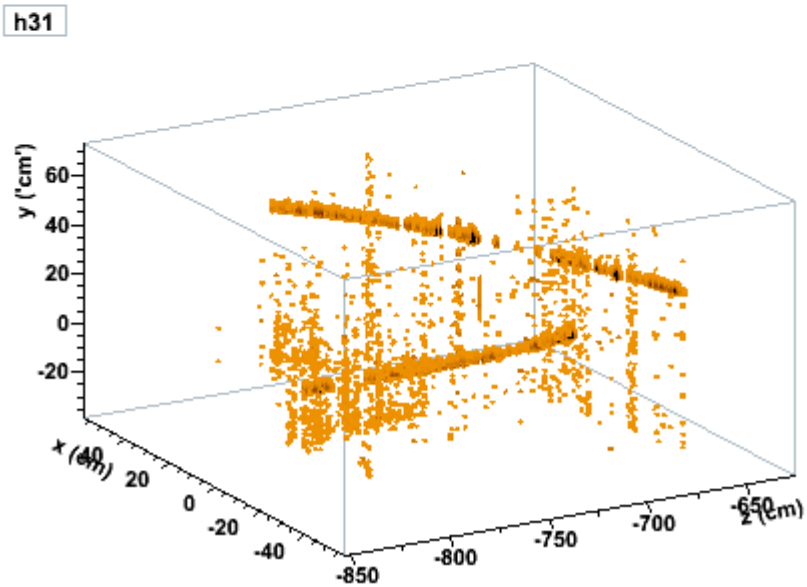
Mom.: 58 GeV/c
Target: LH2
Run: 13287
SubRun: 0
Event: 3113

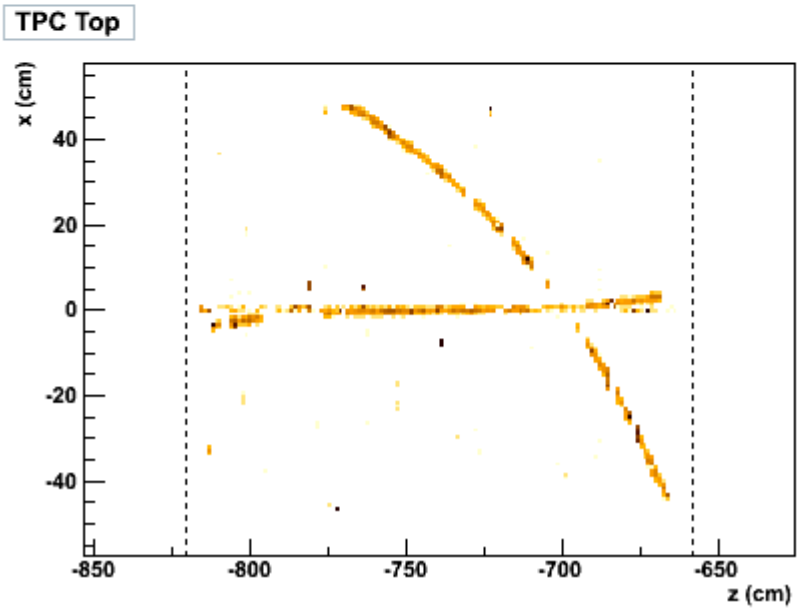
Sun Mar 13 2005
11:01:35.866739

*** Trigger ***
Beam
Word: 0001
Bits: 0007









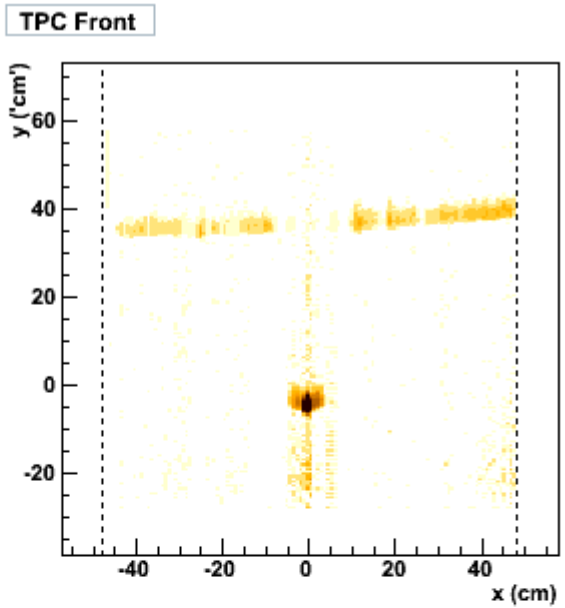
TPC DISPLAY AFTER CUTTING PADS ABOVE 30 HITS for run 13287 Event 3113

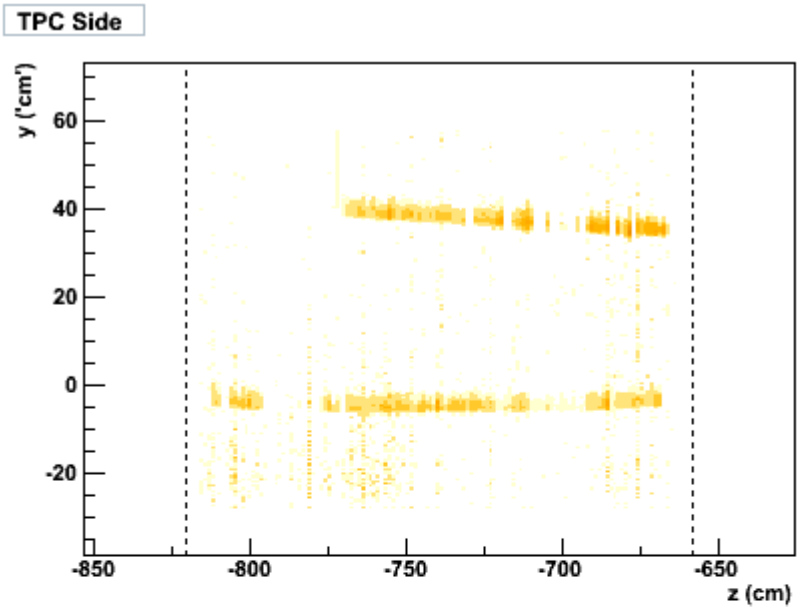
MIPP (FNAL E907)

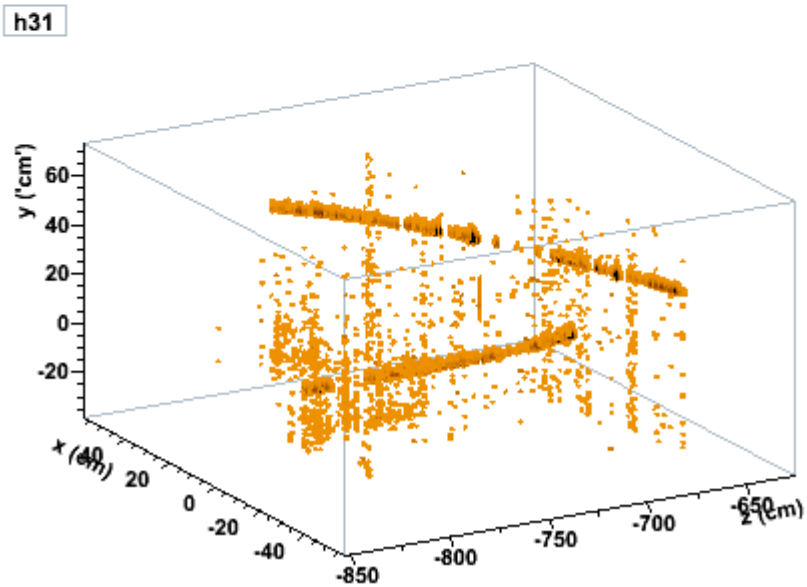
Mom.: 58 GeV/c
Target: LH2
Run: 13287
SubRun: 0
Event: 3113

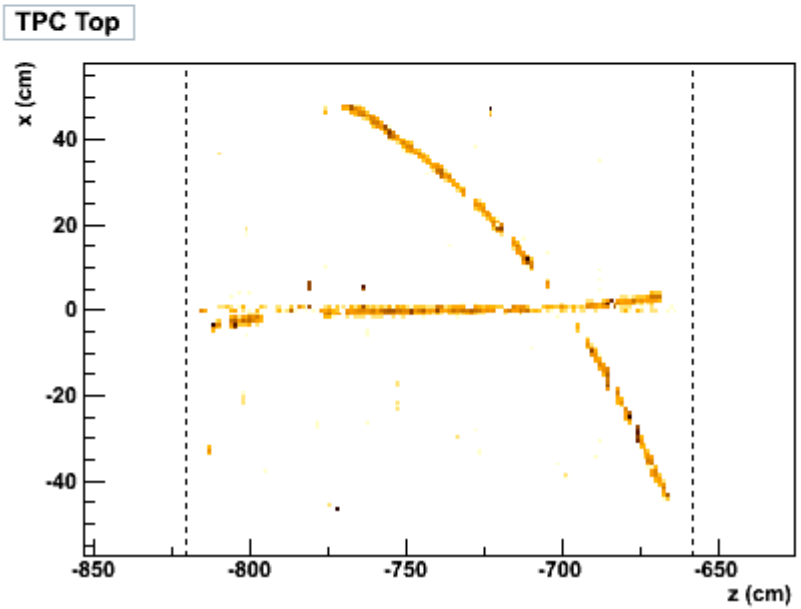
Sun Mar 13 2005
11:01:35.866739

*** Trigger ***
Beam
Word: 0001
Bits: 0007

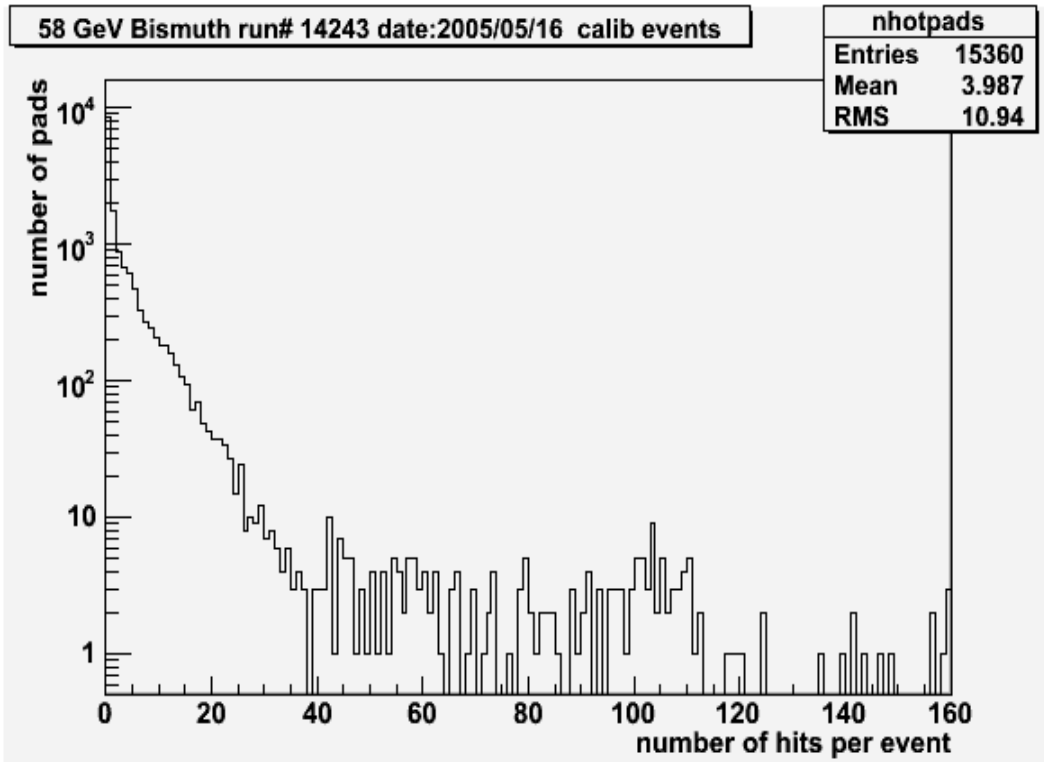


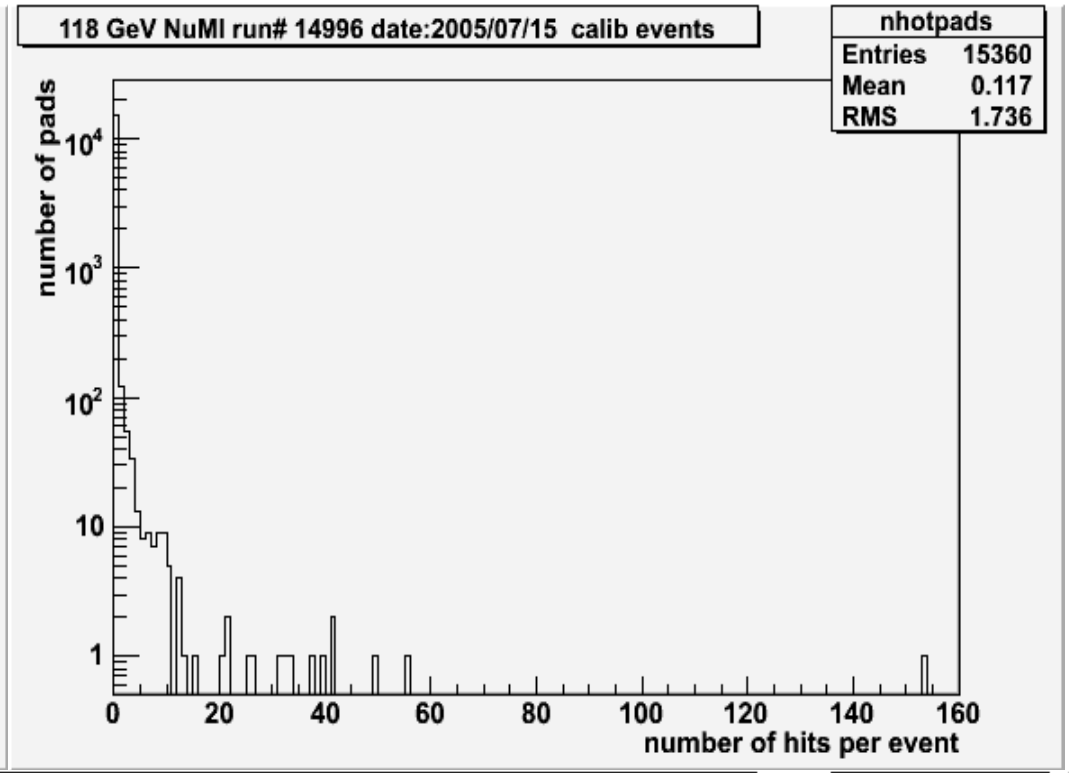


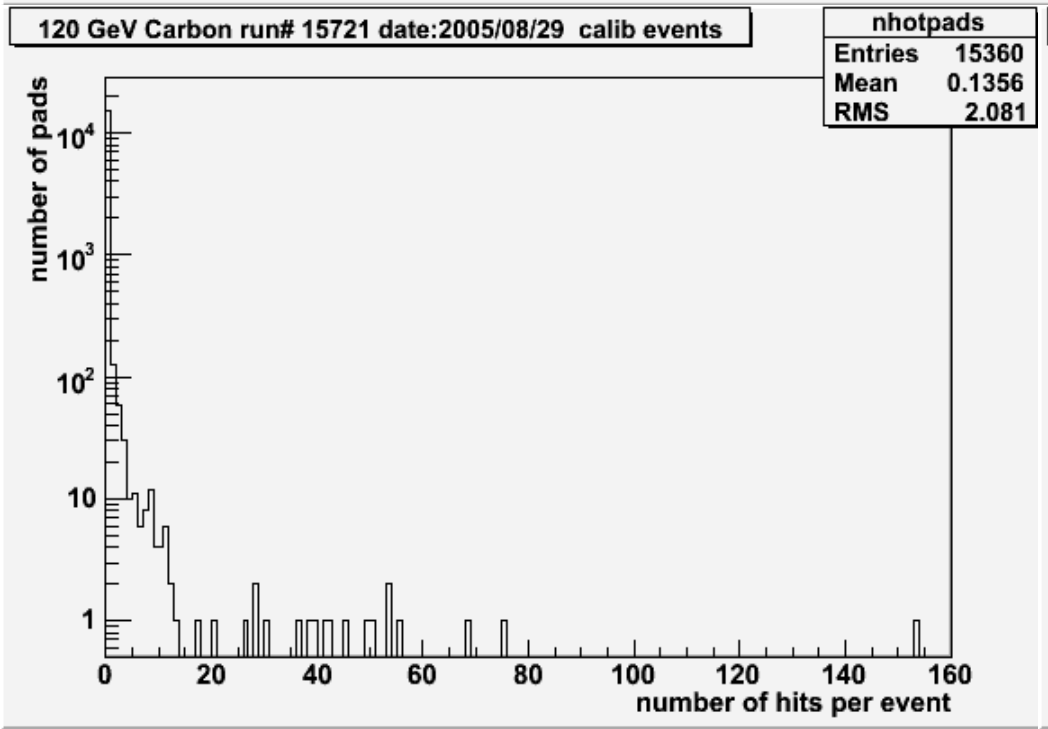


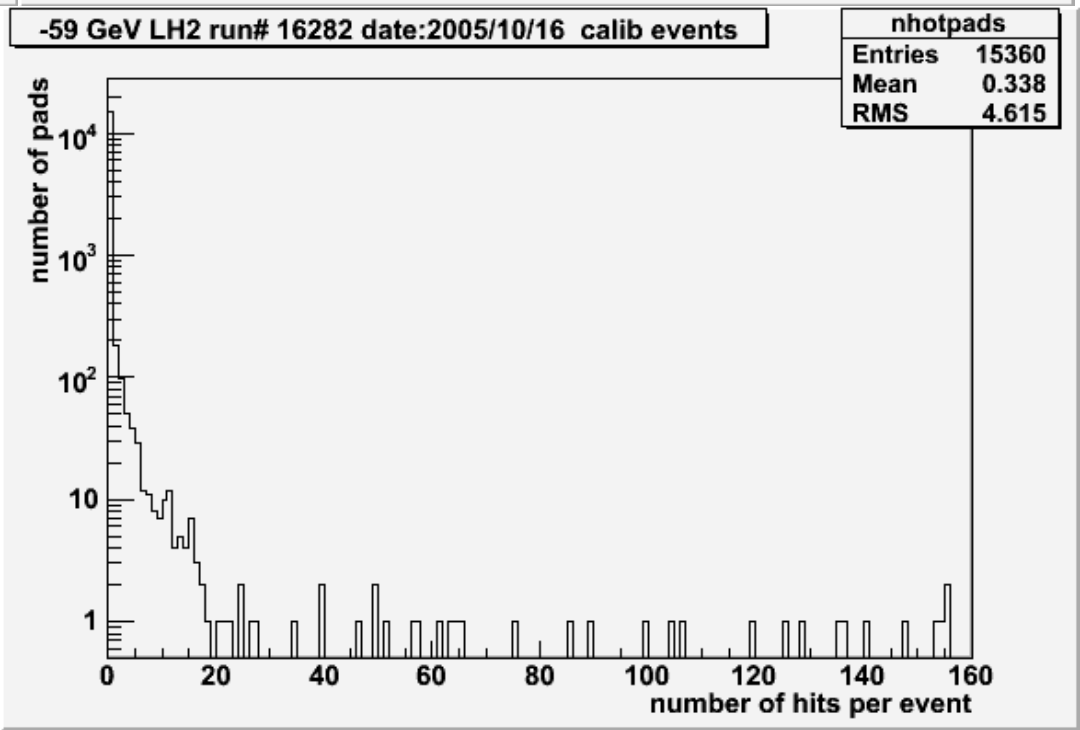


HIT DISTRIBUTION FOR OTHER RUNS









Summary of Hot Pads Search

-Looking at hit distributions on page 12, I think number of pads start to fluctuate if number of hits above 40, especially at run 14243

- Cutting pads above 40 or 30 hits does not make much difference on TPC Display

-Therefore, removing pads having above 40 hits per event seems to me reasonable

- We should put hot pads to database for each subrun

-TPCR2DClusterFind.cxx code can read database and ignore hot pads for each subrun

-Now, the code ignore pads with above 40 hits event by event. This is necessary because there are some noisy channels which are not seen in calibration events.

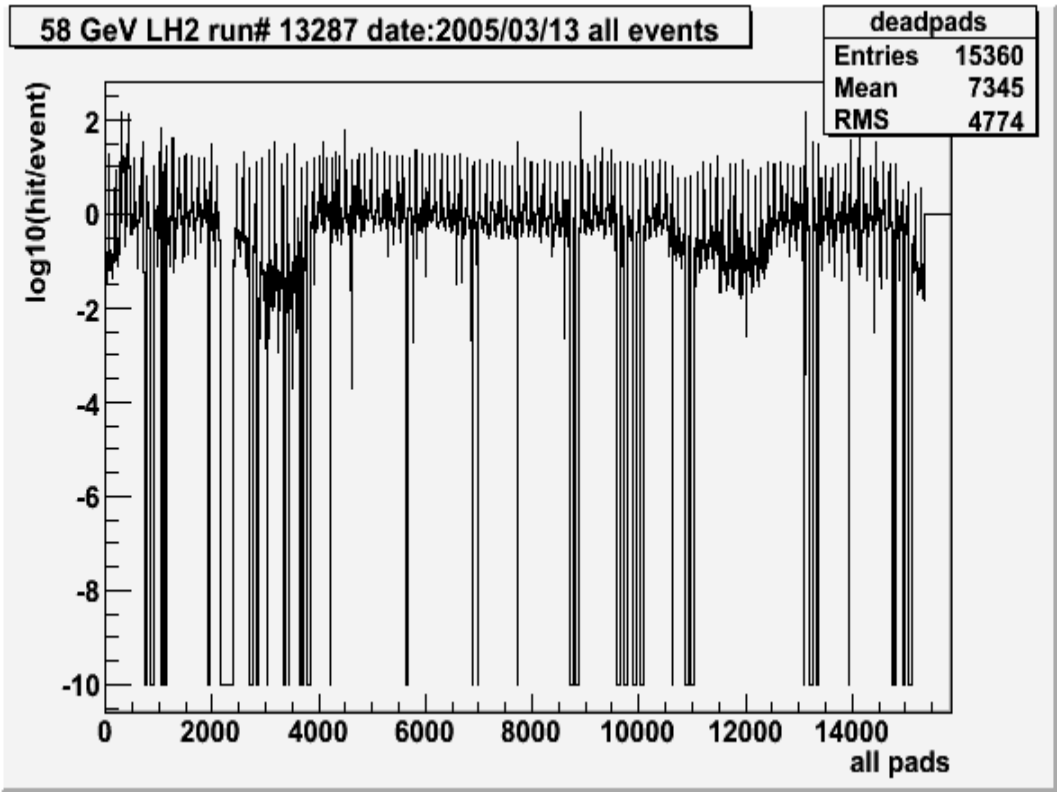
DEAD PADS SEARCH

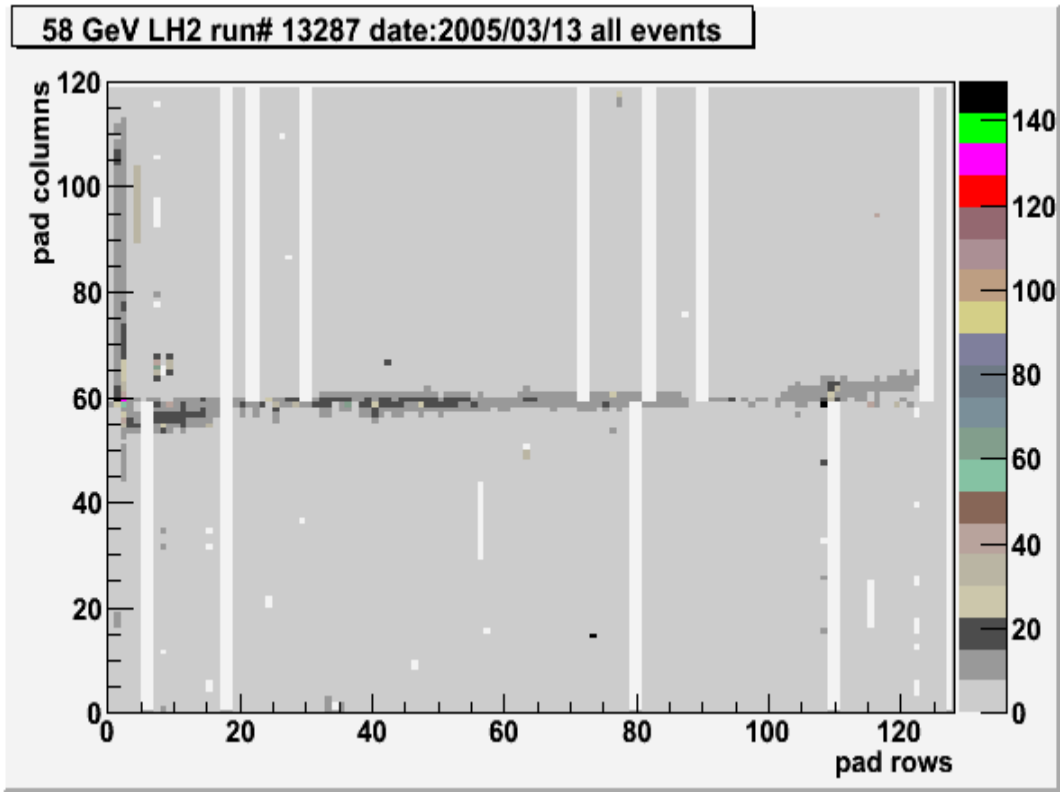
- The same subruns were used as the hot pads search

-All events were used to plot number of hits per event for all pads

-Log10(hit/event) distributions were plotted and -10 was put if a pad has no hit

Run 13287 Subrun 0 Hit Distribution for all events





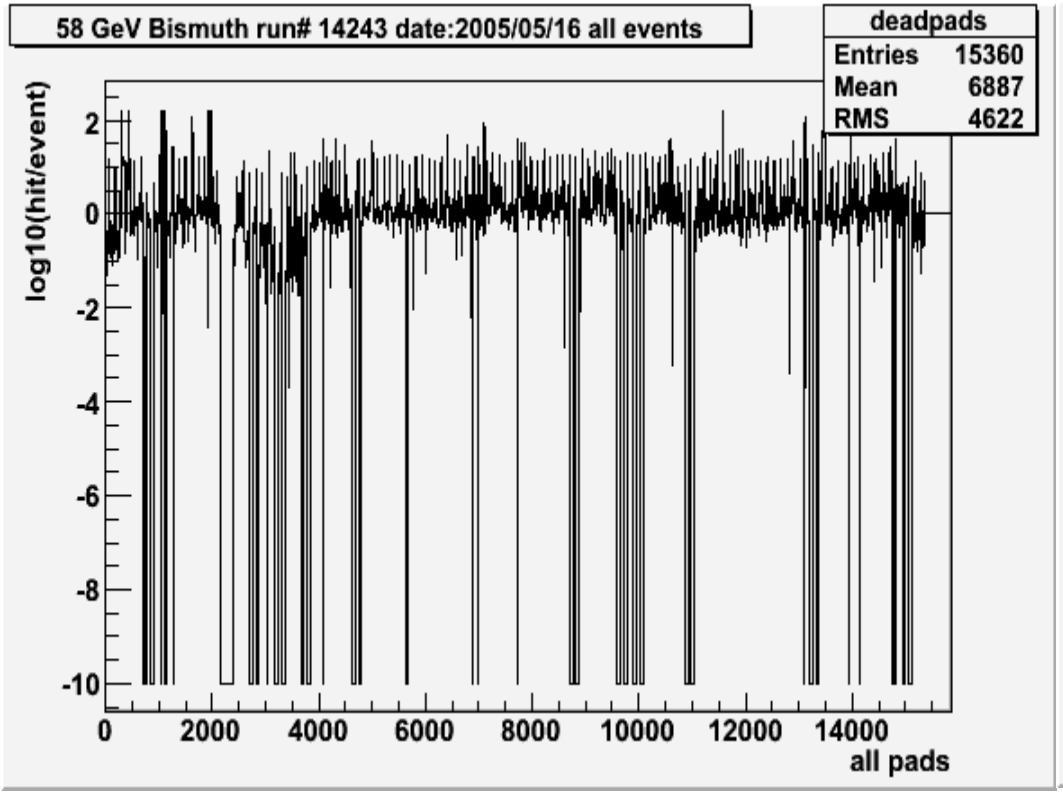
Clearly we can see dead sticks, and also there are some pads having no hits. Most of the pads have number of hits below 10 per event.

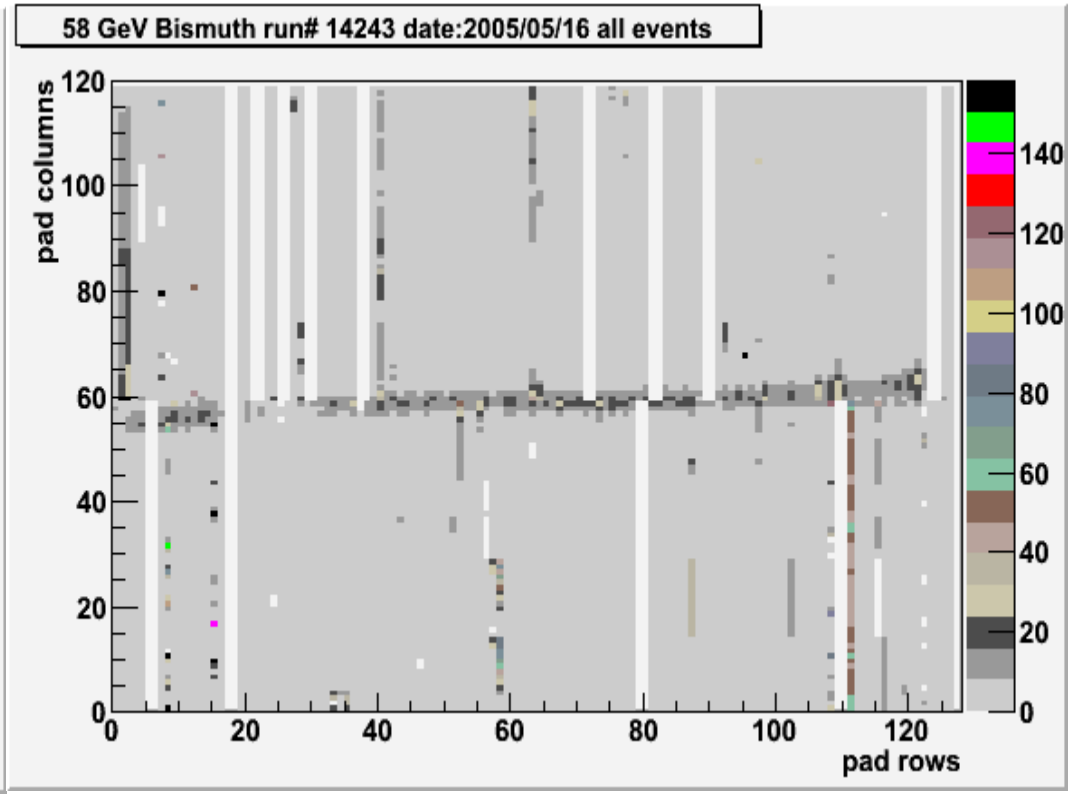
-Number of pads having no hits is 1387

-Number of pads having number of hits below 0.001 per event is 1413

-Number of pads having number of hits below 0.01 per event is 1464

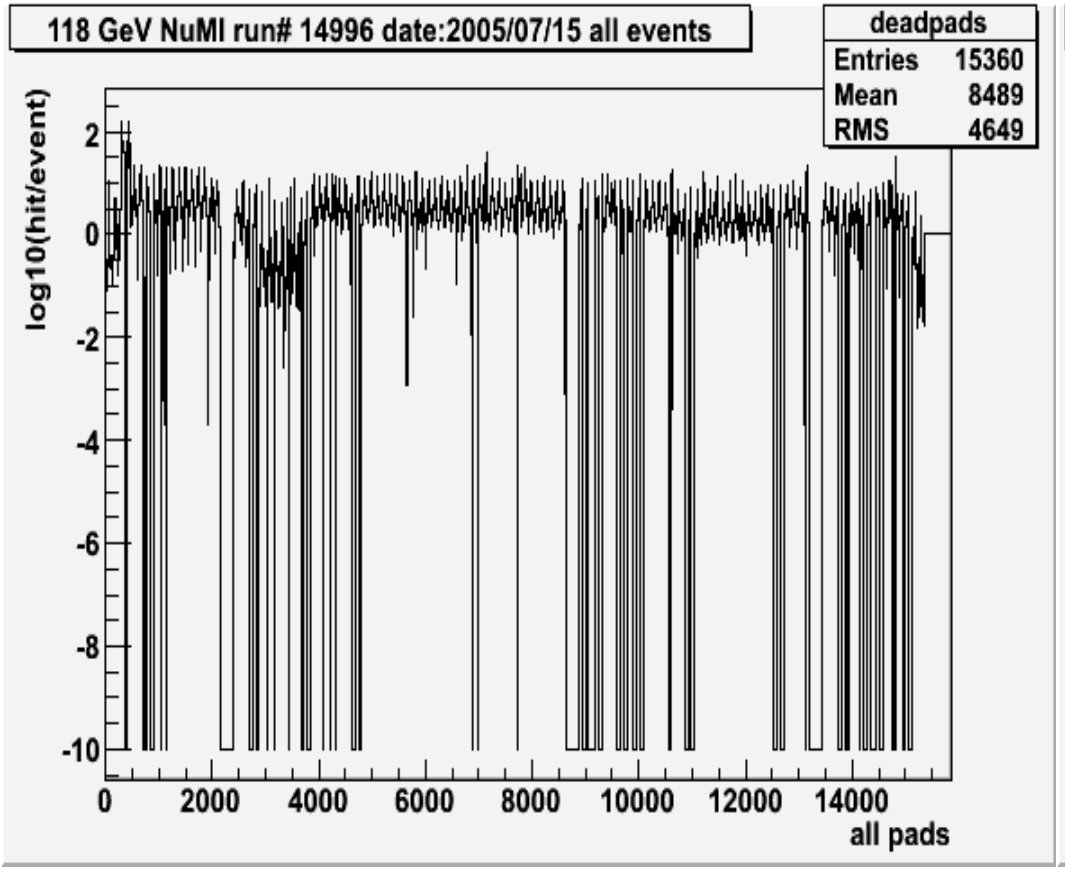
Run 14243 Subrun 0 Hit Distribution for all events

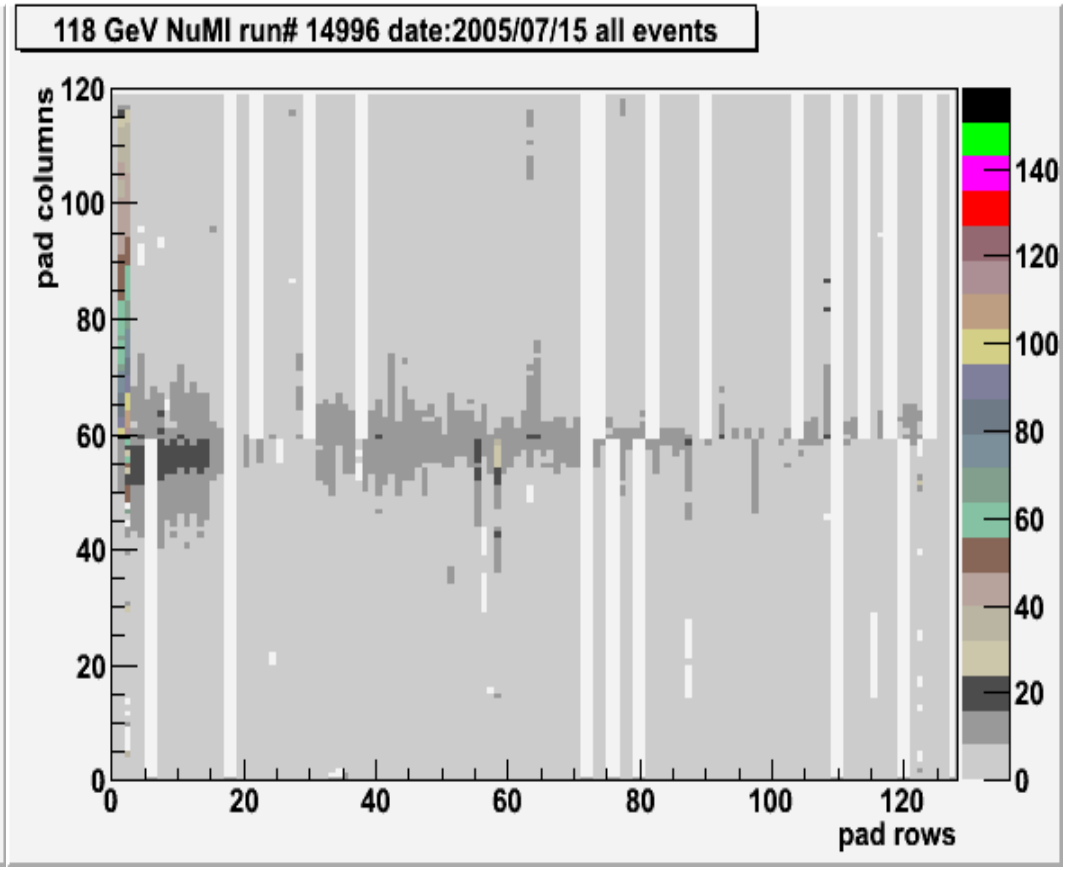




-Number of pads having no hits is 1638
-Number of pads having number of hits below 0.001 per event is 1652
-Number of pads having number of hits below 0.01 per event is 1668

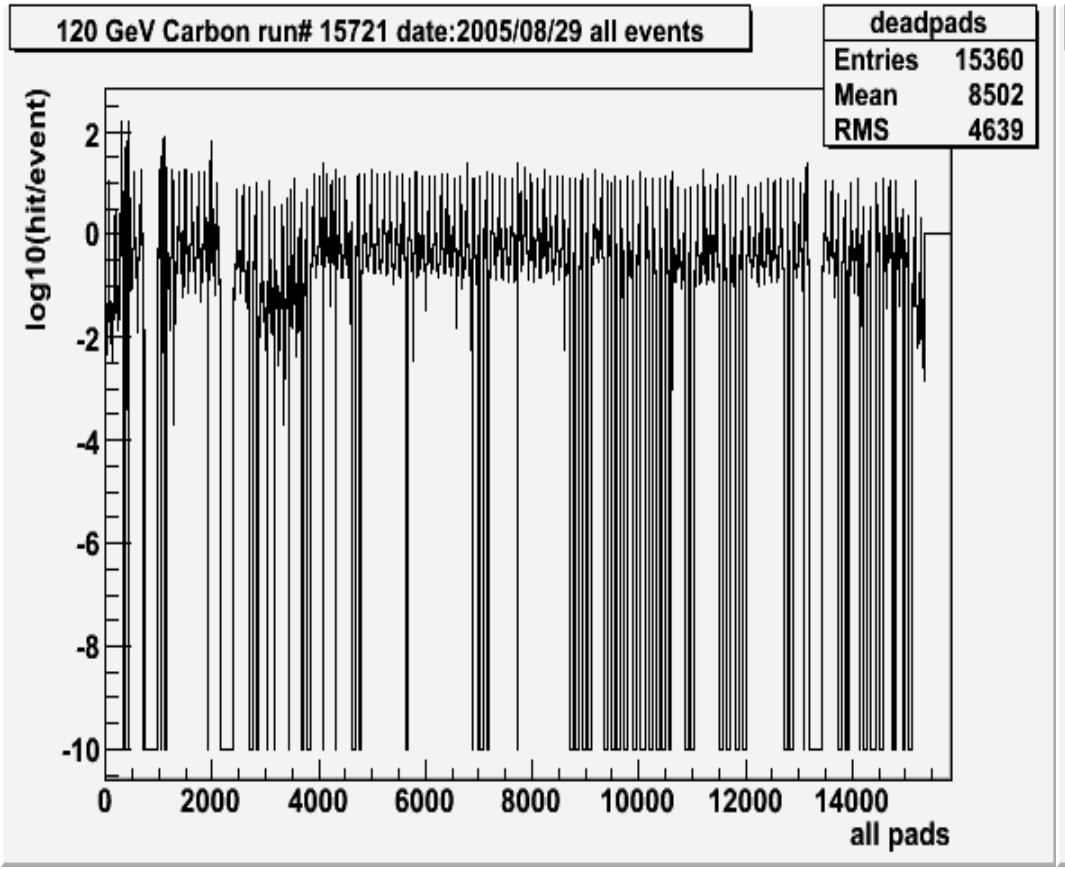
Run 14996 Subrun 0 Hit Distribution for all events

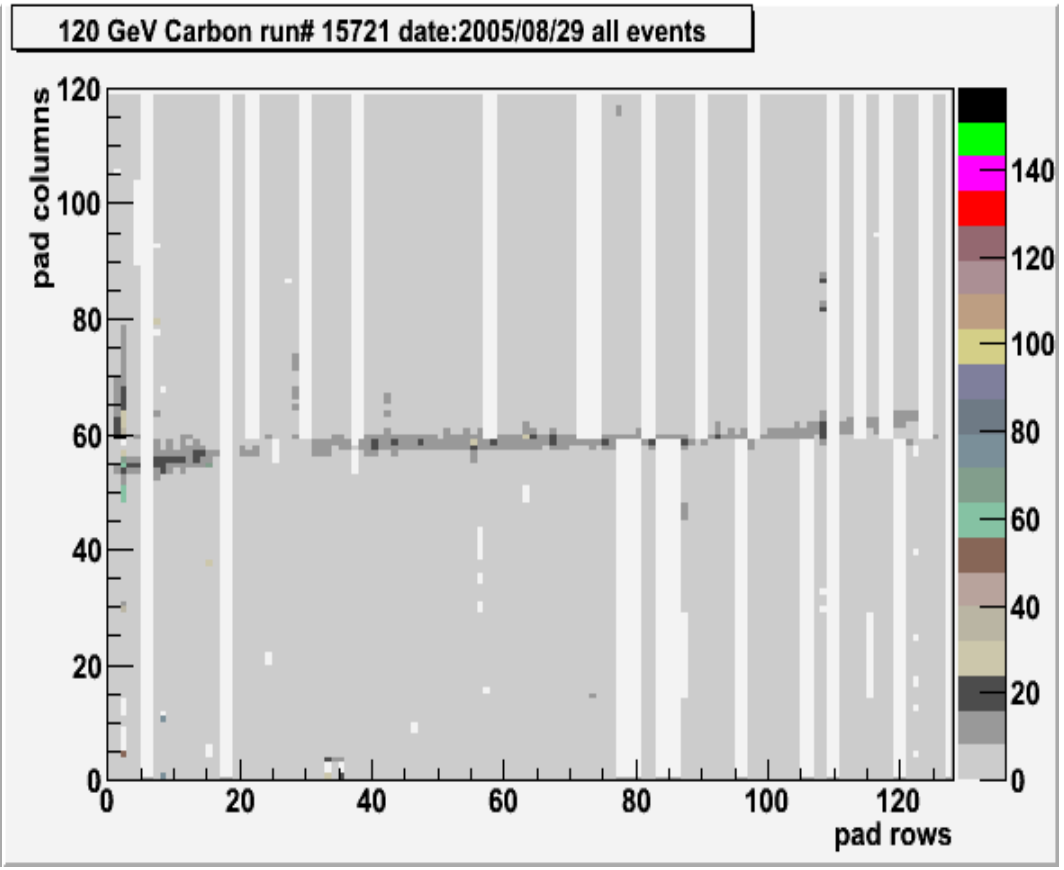




-Number of pads having no hits is 2491
-Number of pads having number of hits below 0.001 per event is 2525
-Number of pads having number of hits below 0.01 per event is 2535

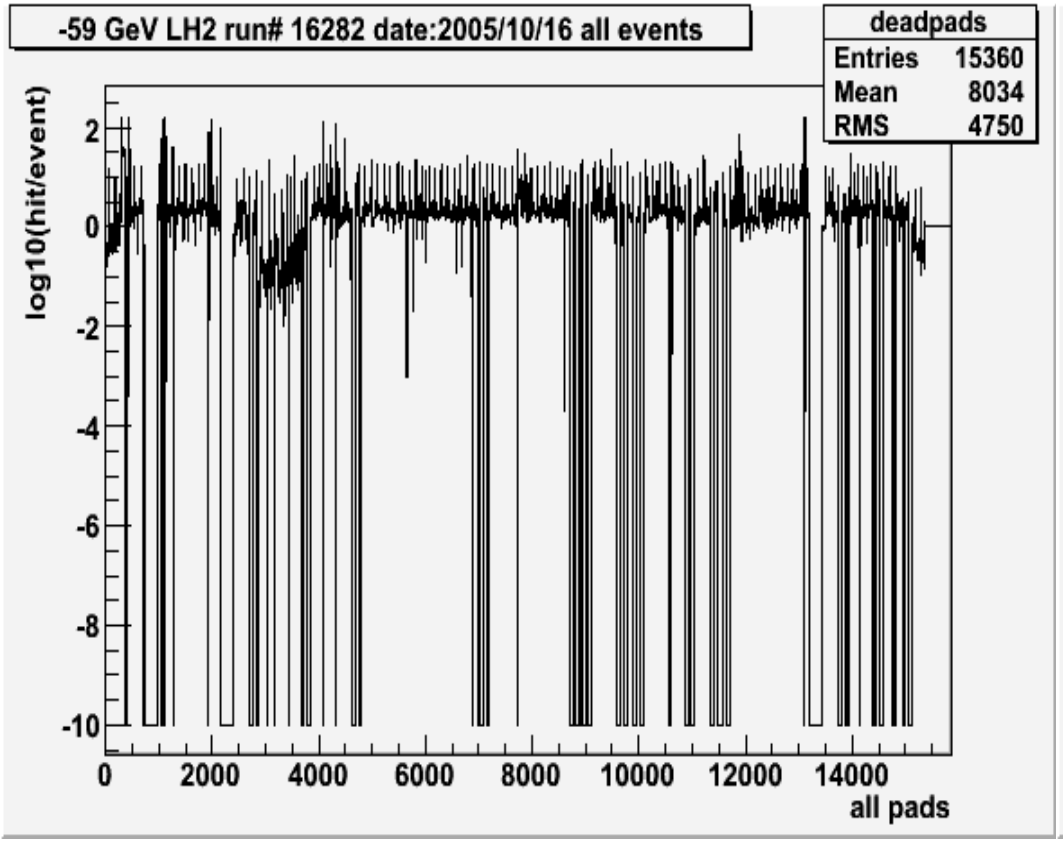
Run 15721 Subrun 0 Hit Distribution for all events

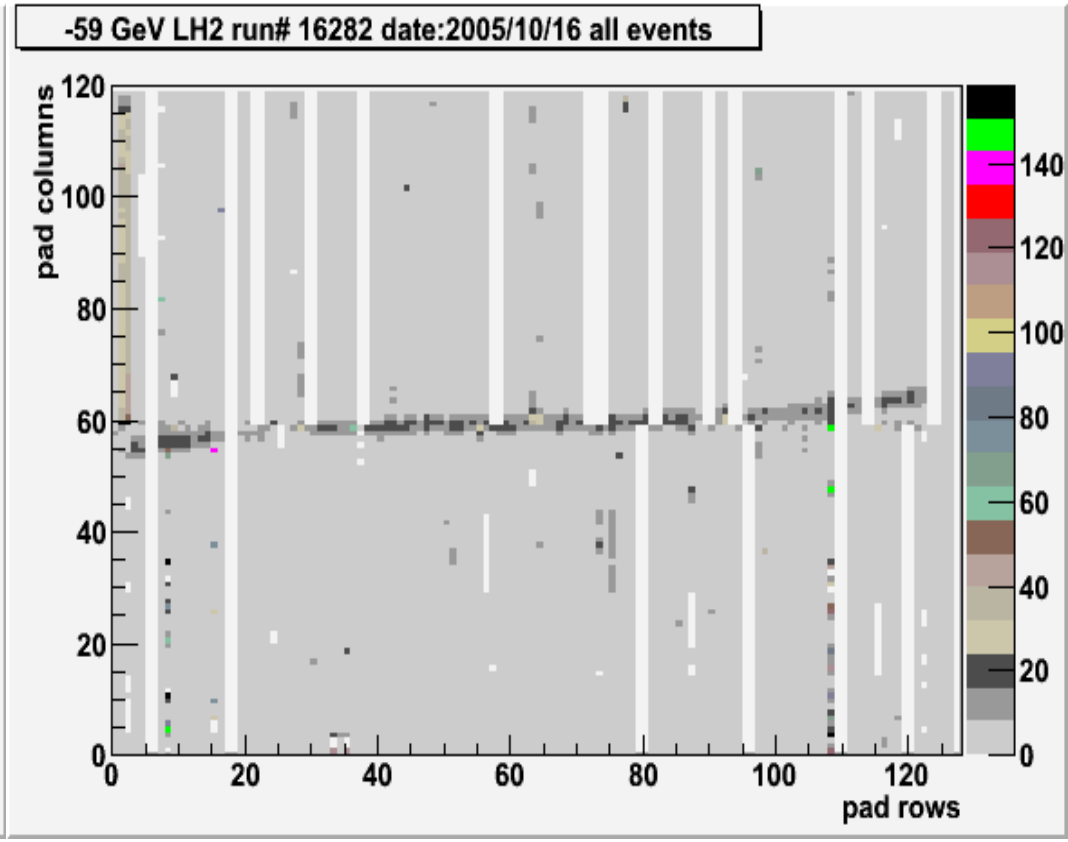




-Number of pads having no hits is 3104
-Number of pads having number of hits below 0.001 per event is 3130
-Number of pads having number of hits below 0.01 per event is 3239

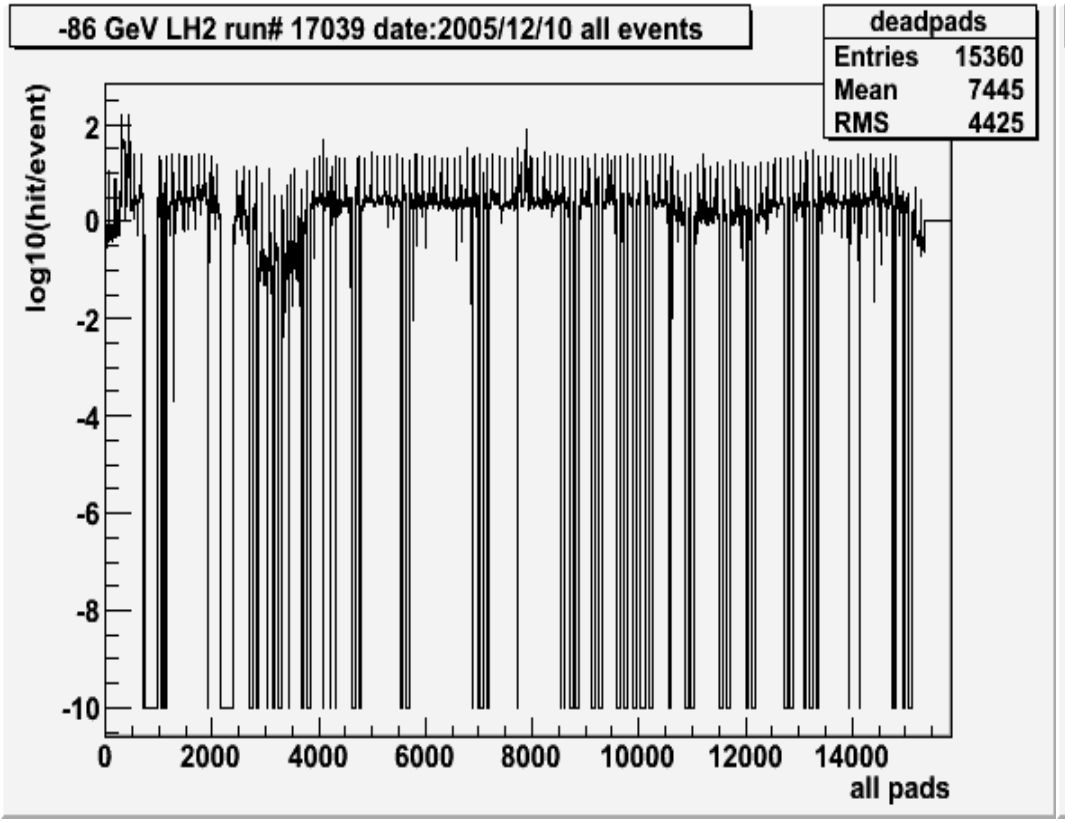
Run 16282 Subrun 0 Hit Distribution for all events

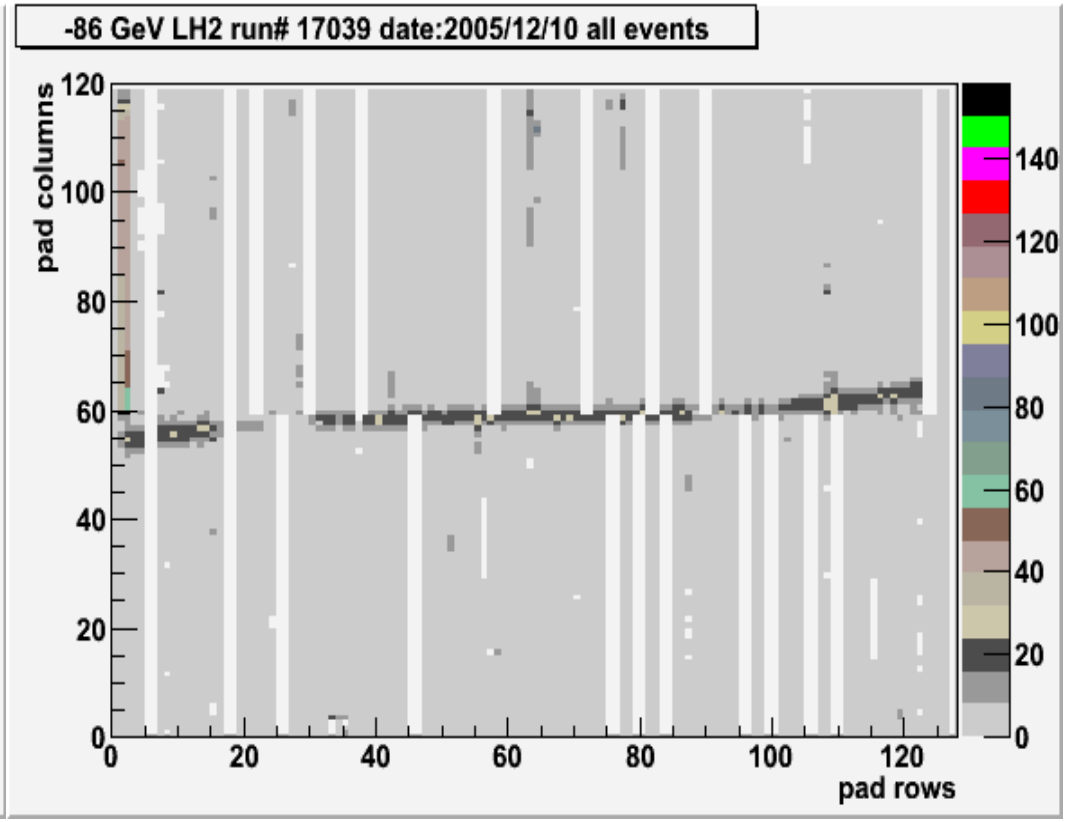




-Number of pads having no hits is 2514
-Number of pads having number of hits below 0.001 per event is 2548
-Number of pads having number of hits below 0.01 per event is 2565

Run 17039 Subrun 0 Hit Distribution for all events





-Number of pads having no hits is 2629
-Number of pads having number of hits below 0.001 per event is 2651
-Number of pads having number of hits below 0.01 per event is 2659

Summary of the Dead Pads Search

-Now, TPCR2DClusterFind.cxx code use pedestal results to determine dead pads

-We can define dead pads looking at plots as the pads having number of hits per event below 0.001

-Again, we can put dead pads into database subrun by subrun