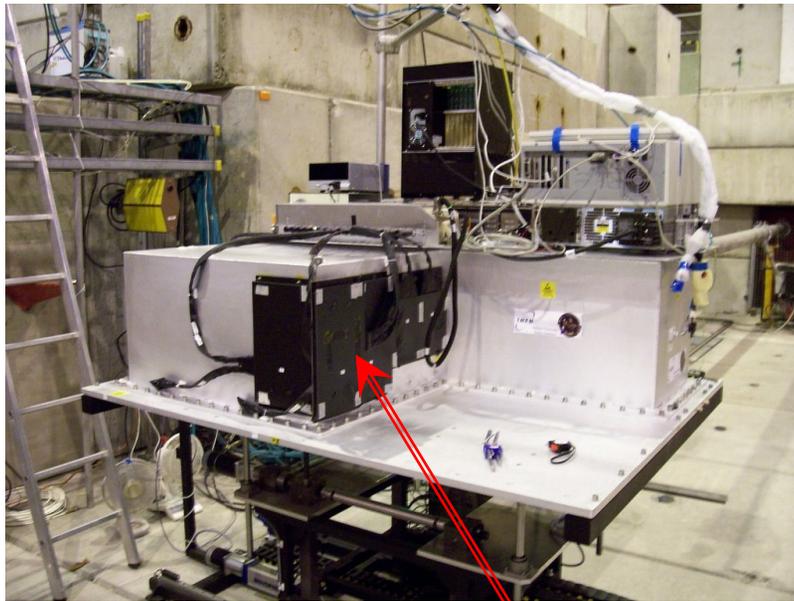


CERN-2006 Beam test: ACD Calibration for the off-line analysis

Calibration parameters for 5 ACD tiles:

- pedestals
- MIP peak positions
- tiles light yield



ACD Tiles

*Results are placed in BT
Confluence page, in
Calibration section, ACD*

*Alex Moiseev, Eric
Charles, and Luis
Reyes*

*Beam test VRVS, October
3, 2006*

Task: Determine the MPV of pulse height caused by normal incidence minimum ionizing particle in every ACD channel (PMT)

Approach: point the normal incidence beam to the center of each tile

PS, 5 GeV pion beam, ~ 5cm diameter

Runs used for PS calibration :

Tile 0 – run 700000837

Tile 1 – run 700000838

Tile 2 – run 700000839

Tile 3 – run 700000840, 700000841

Tile 4 – run 700000842

Tile	GAFE	Recon Tile	Pedestal	Pedestal sigma	MIP, pedestal subtracted
0	13	130	142	3.3	1498
1	11	120	141	3.2	2077
2	9	110	165	2.6	933
3A	15	100A	1034	3.2	1666 for 1.3× PMT_A+PMT_B
3B	17	100B	583	3.2	
4	7	0	213	3.3	454

Tile 3 has wrong fiber routing pattern: instead of being routed every fiber alternatively to the first and second PMT, they are erratically routed to the same PMT by the groups of ~10 fibers. This results in the pulse height dependence on the particle hit point.

To correct for this effect, we suggest to use for this tile the linear combination of the signals from both PMTs:

$$S = (\text{PMT_A} - \text{PED}_A) \times 1.3 + (\text{PMT_B} - \text{PED}_B)$$

Factor 1.3 takes care of the PMT gain difference

Do Not use Tile 3 (Recon ID 100) channels separately - only this combination!

SPS

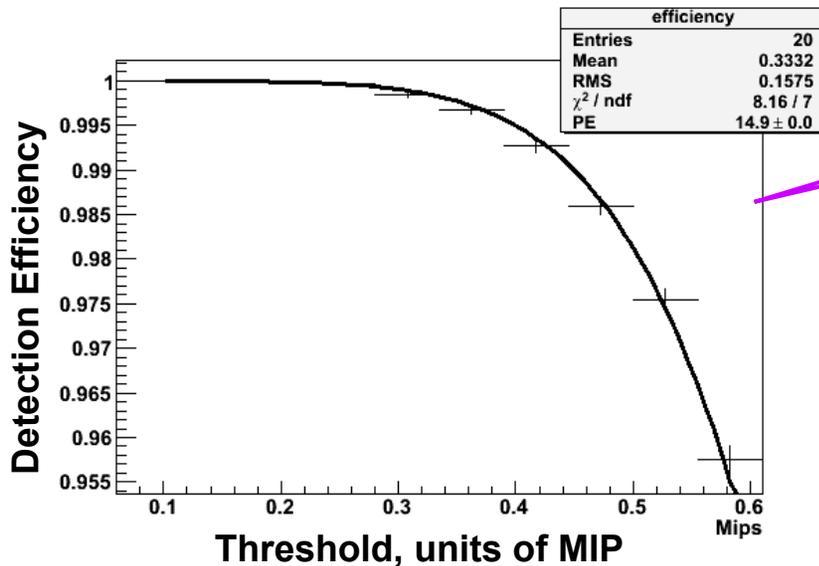
150 GeV protons

Tile 0 - run 700001871
Tile 1 - run 700001870
Tile 2 - run 700001869
Tile 3 - run 700001868 (60 mm off the tile center)
 run 700001867 (-60mm off the tile center)
 run 700001866 - tile center
Tile 4 - run 700001865

Tile	GAFE	Recon Tile	Pedestal	Pedestal sigma	MIP, pedestal subtracted	MIP, relative diff. with PS
0	13	130	140	3.4	1407	-6.1%
1	11	120	141	3.5	1919	-7.6%
2	9	110	167	3.0	884	-4.6%
3A	15	100A	1033	4.1	1599 for 1.3× PMT_A+PMT_B	-4.0%
3B	17	100B	567	5.0		
4	7	0	212	3.2	495	+9.0%

Light Yield from Tiles (Luis)

Tile Recon	Number of p.e.	Comment
0 (Tile 4)	14.9	
100 (Tile 3)	29.2	Two PMTs combined together
110 (Tile 2)	16.8	
120 (Tile 1)	34.7	Smaller tile – larger L.Y.
130 (Tile 0)	25.3	Smaller tile – larger L.Y.



Example for
Tile 0

Light yield was determined by fitting efficiency vs. threshold dependence by Poisson distribution where the distribution mean value represents the mean number of p.e.