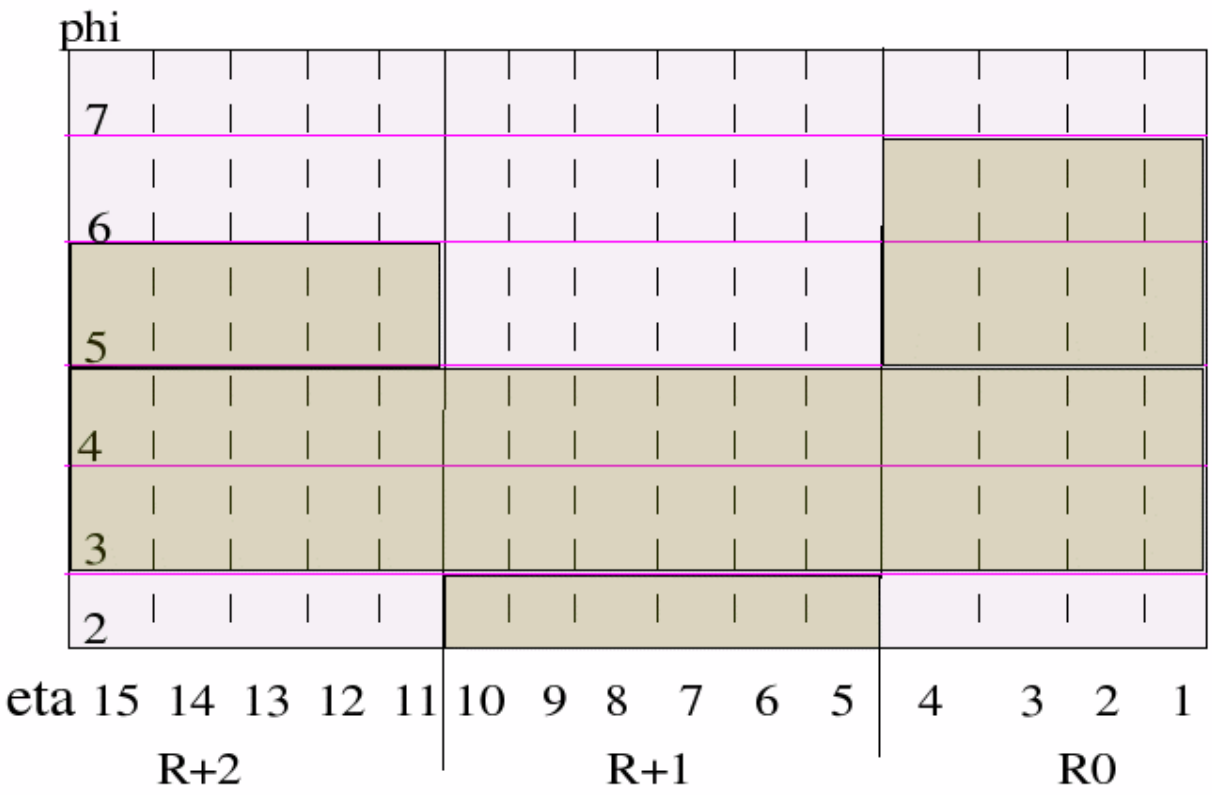
Calibration of HO tiles in TB2006

G. Majumder & S. Bose
T.I.F.R.

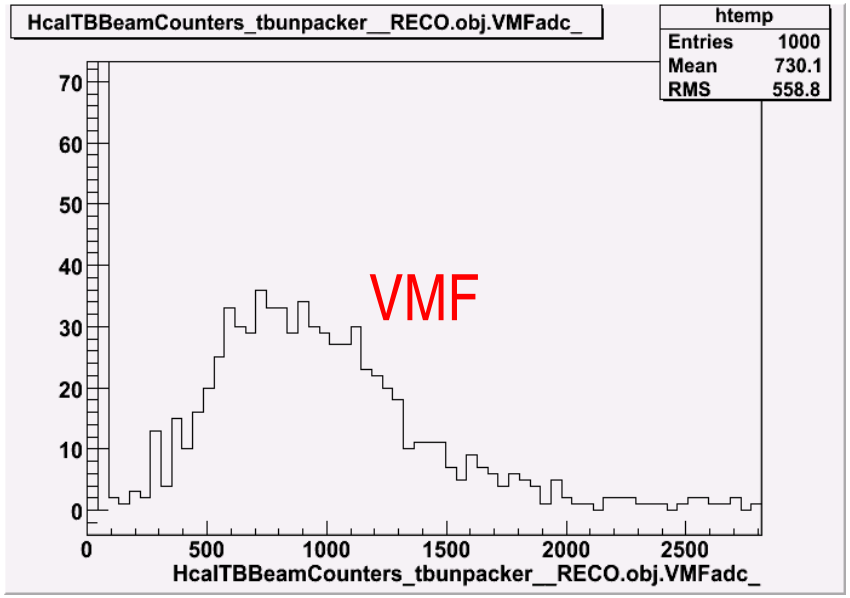
- Date taken on Aug 16th with 150 GeV mu minus beam
- Run # 28288 to 28349
- Statistics : 20K/tower
-

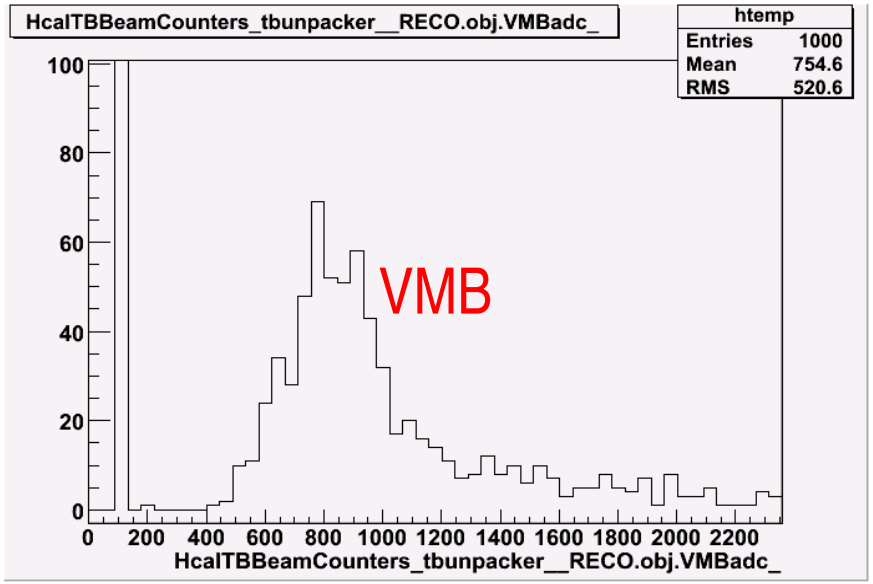
The HO Barrel structure – only shaded areas are connected for signal



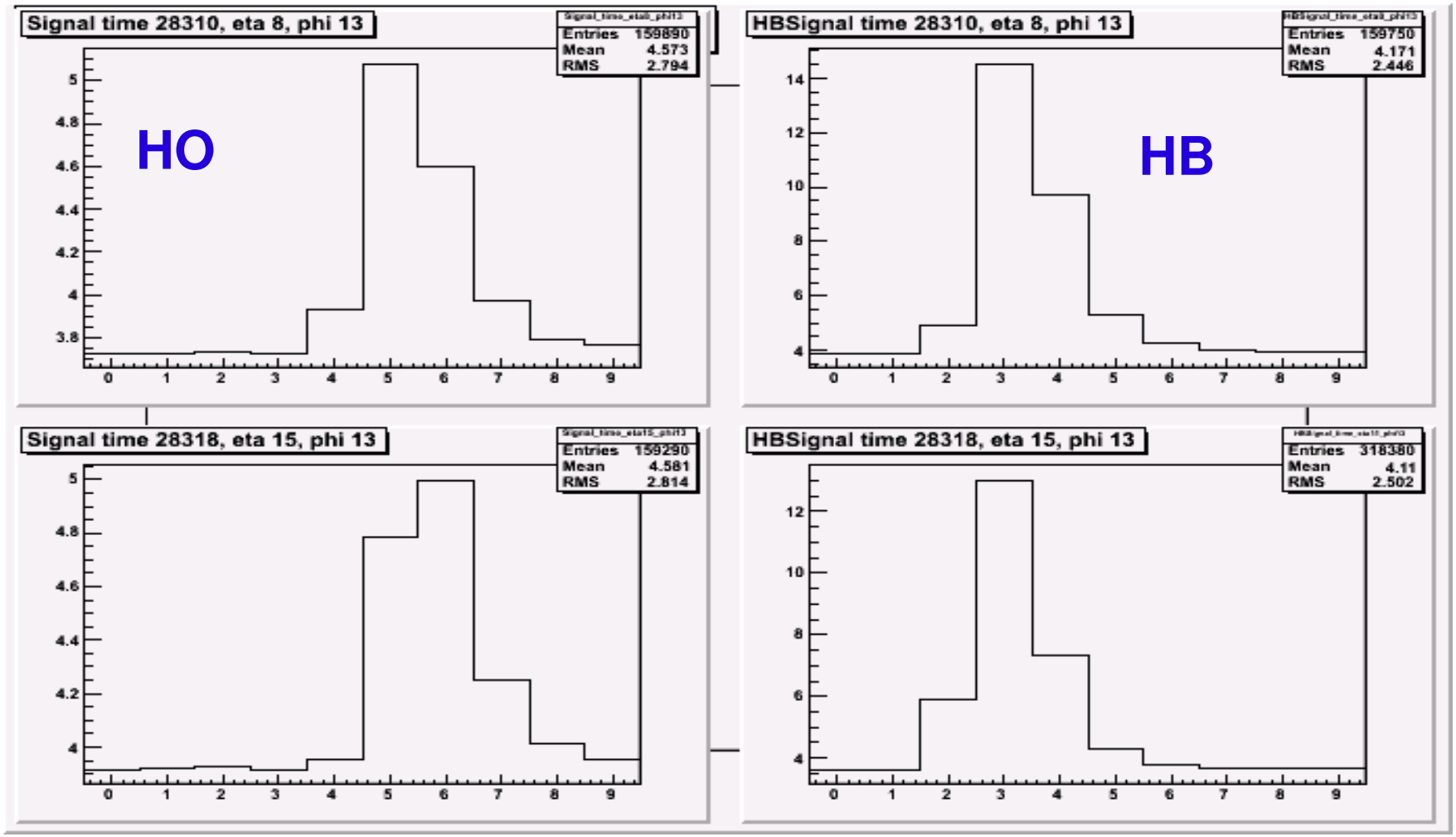
Pedestal and signal events

- Pedestal events : All kind of pedestal trigger events
- Signal event : beam trigger events with criteria VMFadc() >200 && VMBadc() > 400
- Pedestal is fitted with Gaussian function
- Signal function is Gaussian(width fixed from ped data) + Gaussian convoluted Landau





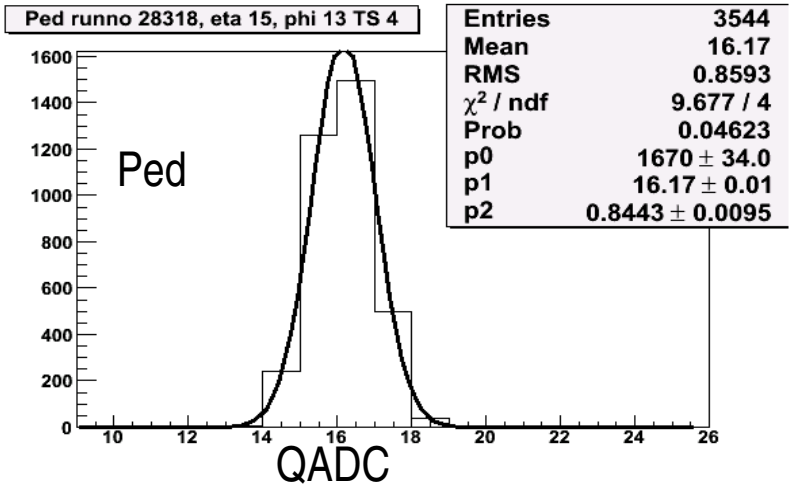
Time profile of signals

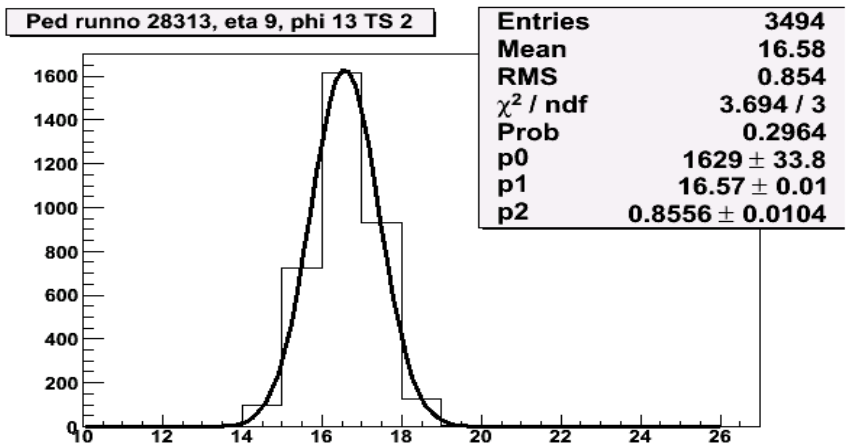


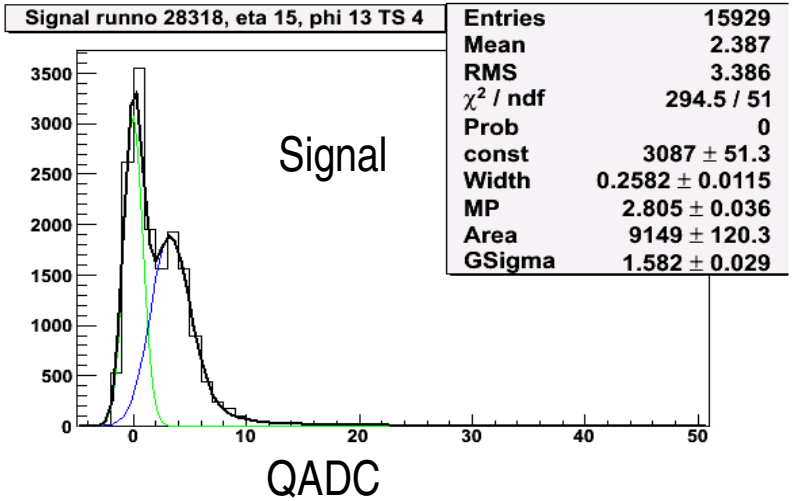
Different tower has different time profile

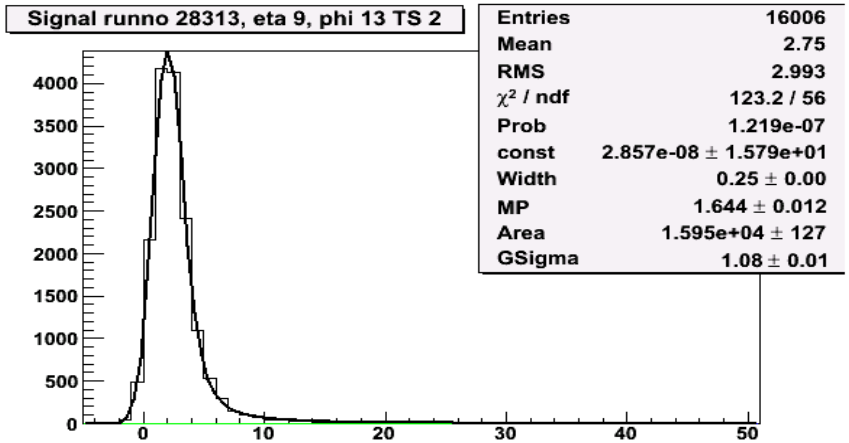
First select the time slots (signal is calculated by adding pulse in successive four time slots)

QADC distribtuions of signal and pedestal events



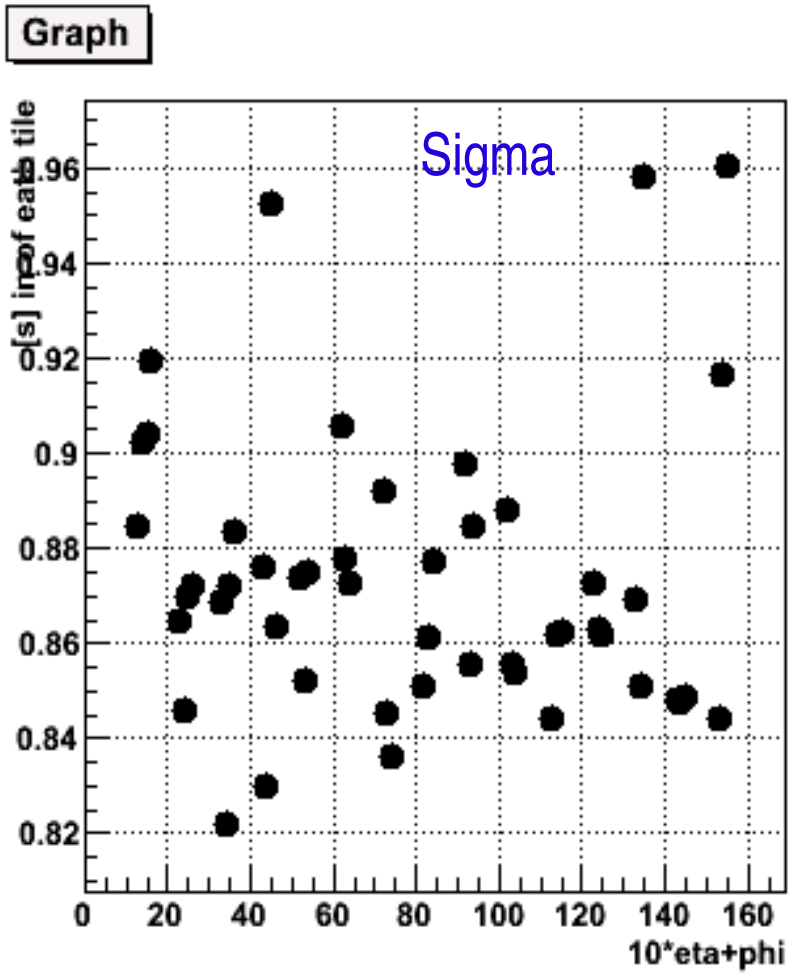


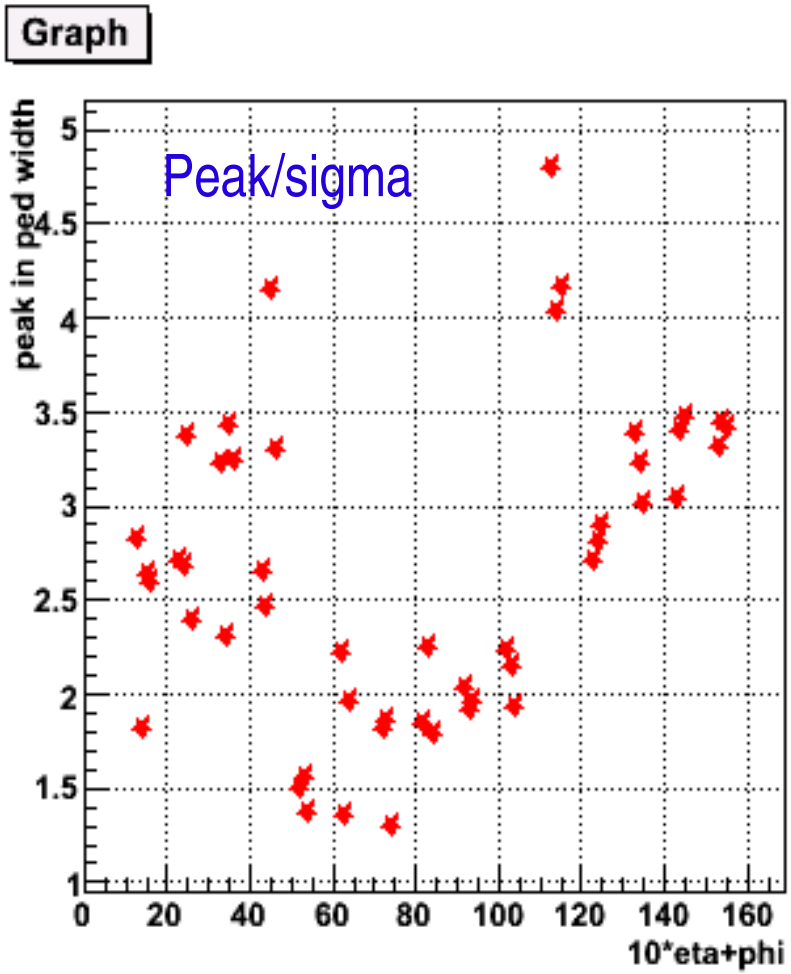




- **Run # 28318 : Large pedestal events, beam might have not focussed on the center**
- **Run # 28313 : Unexpectedly no pedestal, which was expected for this signal. Most of the signal looks like this.**

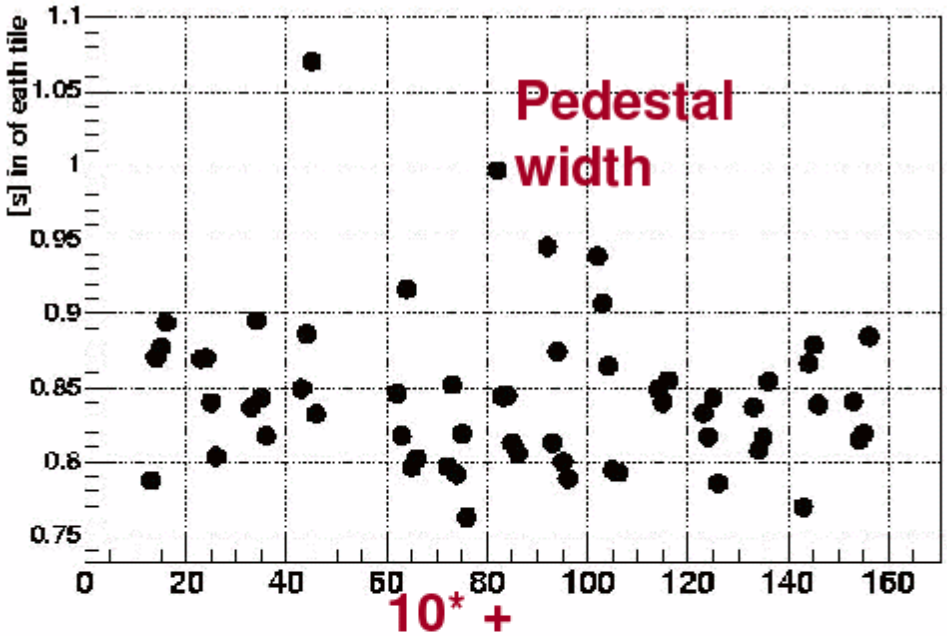
Pedestal widths and signal peaks

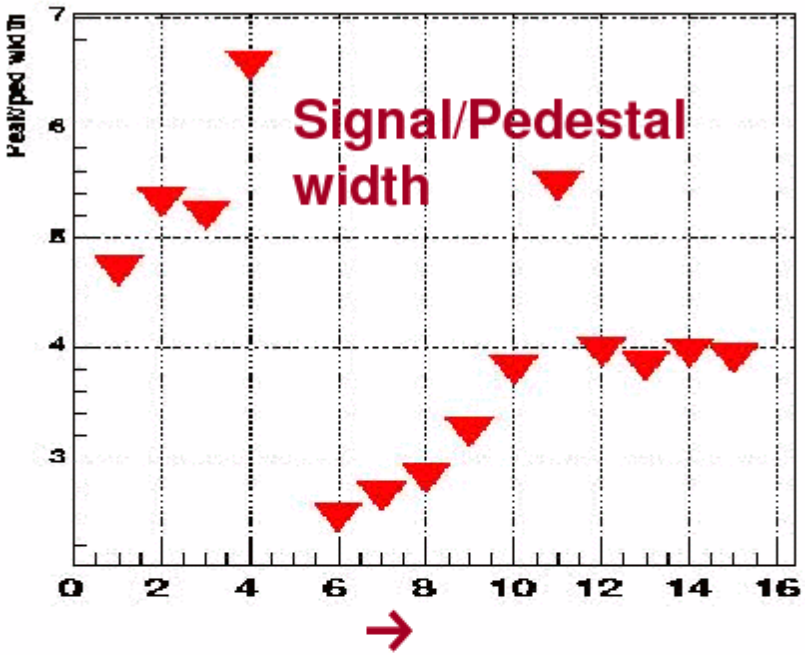




- **Signals are poor in comparison with TB2004 data**

Pedestal width and signal separation : TB2004





- Pedestal widths are ~0.85 fC
- Best signal separation (Signal/pedestal width) is in Ring 0 tiles due to two layers, whereas minimum separation is in Ring 1
- All Signals are about 2.0 (but there was no data for =5 tile, where the expected signal is minimum)

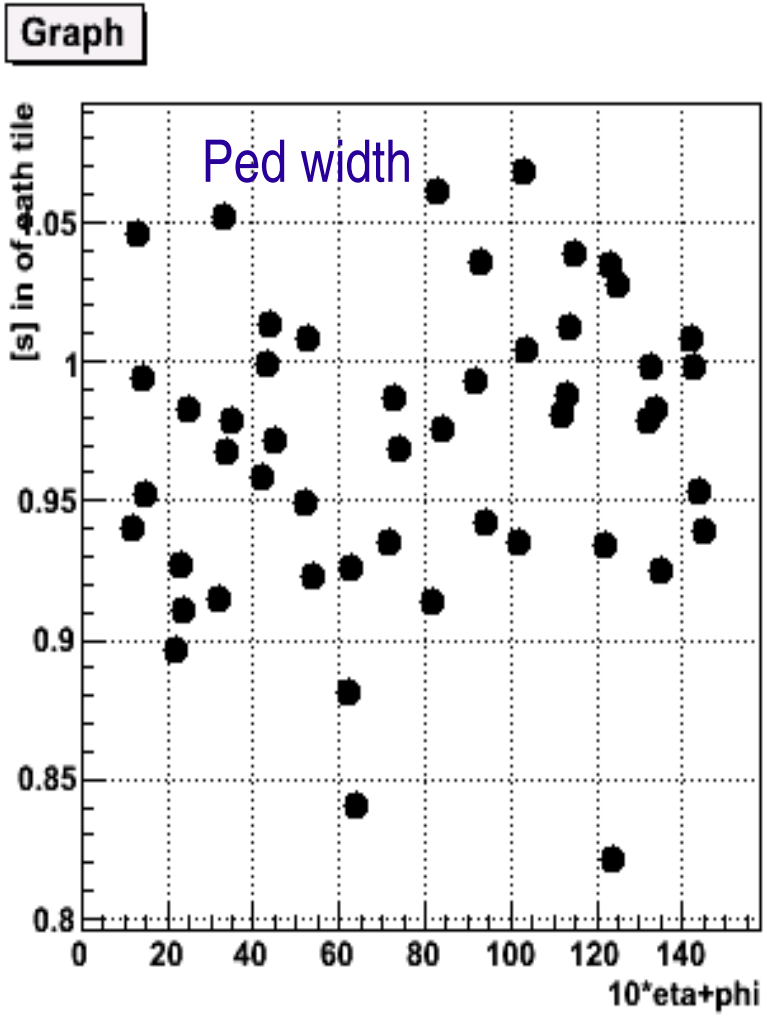
Calibration constants

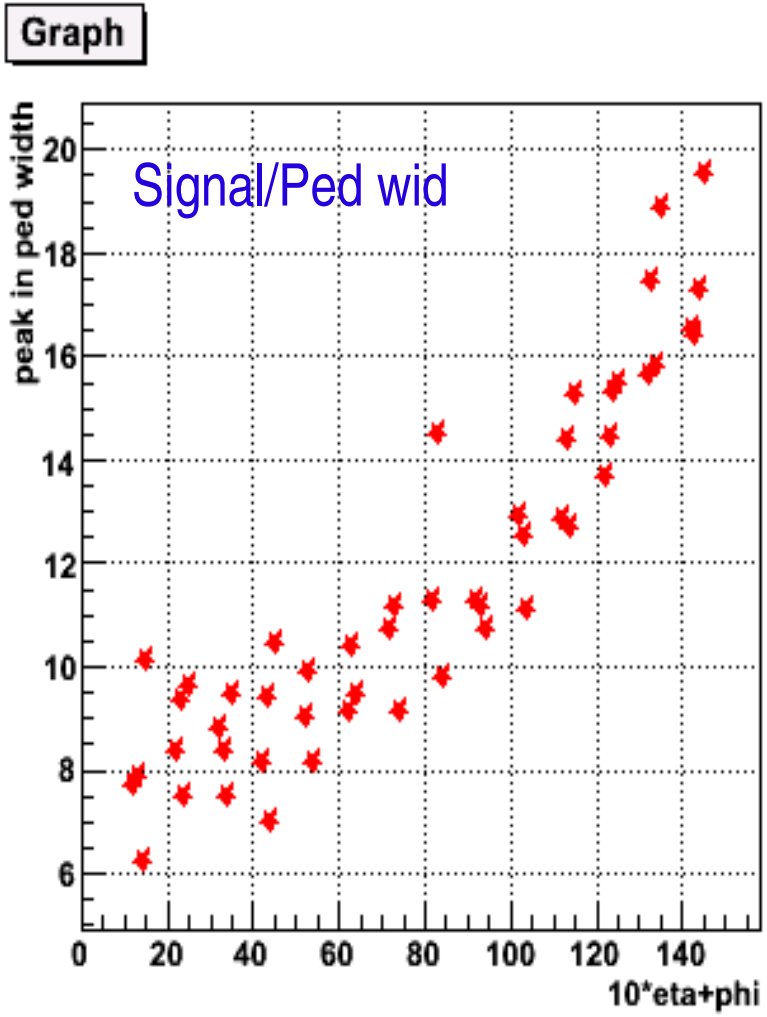
eta	phi	ts	signal	const
1	4	4	1.6448	0.6085
2	4	4	2.2809	0.4422
3	4	4	1.9070	0.5369
4	4	3	2.0585	0.5086
5	4	4	1.2090	0.8917
6	4	4	1.7198	0.6497
7	4	3	1.0904	1.0686
8	4	4	1.5830	0.7719
9	4	3	1.7430	0.7389
10	4	3	1.6551	0.8240
11	4	4	3.4840	0.4162
12	4	4	2.4365	0.6350
13	4	4	2.7601	0.6001
14	4	4	2.8926	0.6146
15	4	5	3.1639	0.6047

eta	phi	ts	signal	const
1	3	4	2.5101	0.3988
2	3	4	2.3585	0.4276
3	3	4	2.8074	0.3647
4	3	3	2.3357	0.4483
5	3	4	1.3391	0.8051
6	3	3	1.1995	0.9316
7	3	3	1.5754	0.7396
8	3	4	1.9400	0.6298
9	3	3	1.6442	0.7833
10	3	3	1.8469	0.7384
11	3	4	4.0567	0.3574
12	3	4	2.3754	0.6513
13	3	4	2.9576	0.5600
14	3	4	2.5933	0.6856
15	3	5	2.8054	0.6819

eta	phi	ts	signal	const
5	2	3	1.3192	0.8172
6	2	3	2.0160	0.5543
7	2	3	1.6364	0.7121
8	2	4	1.5752	0.7757
9	2	3	1.8340	0.7023
10	2	3	1.9953	0.6835
1	6	4	2.4001	0.4170
2	6	4	2.0965	0.4811
3	6	3	2.8674	0.3571
4	6	3	2.8536	0.3669
1	5	4	2.3954	0.4179
2	5	3	2.9374	0.3434
3	5	4	2.9947	0.3419
4	5	3	3.9707	0.2637
11	5	4	3.5952	0.4033
12	5	4	2.5115	0.6160
13	5	5	2.8990	0.5713
14	5	4	2.9508	0.6025
15	5	5	3.2959	0.5804

Signal in HB towers





Calibration constants for HB

1	4	3	6.22	0.160	1	3	4	8.29	0.120	1	2	3	7.30	0.137	1	5	4	9.68	0.103
2	4	4	6.88	0.146	2	3	3	8.72	0.115	2	2	3	7.55	0.133	2	5	4	9.52	0.105
3	4	4	7.29	0.140	3	3	4	8.86	0.115	3	2	3	8.10	0.126	3	5	4	9.29	0.110
4	4	3	7.13	0.146	4	3	3	9.43	0.110	4	2	4	7.86	0.133	4	5	3	10.18	0.102
5	4	2	7.56	0.142	5	3	3	10.02	0.107	5	2	3	8.61	0.125	11	5	3	15.89	0.091
6	4	3	7.98	0.139	6	3	2	9.66	0.115	6	2	3	8.07	0.138	12	5	2	15.96	0.096
7	4	3	8.91	0.130	7	3	3	11.04	0.105	7	2	2	10.05	0.115	13	5	3	17.48	0.094
8	4	3	9.59	0.127	8	3	2	15.40	0.079	8	2	3	10.35	0.118	14	5	3	18.38	0.096
9	4	2	10.14	0.127	9	3	3	11.62	0.110	9	2	2	11.25	0.114					
10	4	3	11.17	0.122	10	3	2	13.42	0.101	10	2	2	12.09	0.112					
11	4	3	12.88	0.112	11	3	3	14.26	0.101	11	2	2	12.63	0.114					
12	4	3	12.62	0.122	12	3	2	14.98	0.103	12	2	3	12.83	0.120					
13	4	3	15.58	0.106	13	3	2	17.44	0.094	13	2	3	15.35	0.107					
14	4	3	16.51	0.107	14	3	2	16.43	0.108	14	2	3	16.68	0.106					

Conclusion

- Signal in HO tiles are lower in comparison with TB2004 data
- Difference with TB2004
  - HO readout module instead of HB
  - Optical cables were lying at CERN for long time (Ring0). Some of them were used for mock up, there was no QC before connecting to trays
  - Ring-1 and Ring-2 signals are consistent with TB2004 (HV of HPD were 10kV instead of 8kV)
- Calibration constant for HO tiles are available.