Overview on May Running Period

Roman Pöschl

LAL Orsay
CALICE Ecal Meeting
3/6/08

- Installation Period

- Beamline at FNAL

- Overview on Data taken

- Outlook on July Running

MTBF – Meson Testbeam Facility at Fermilab

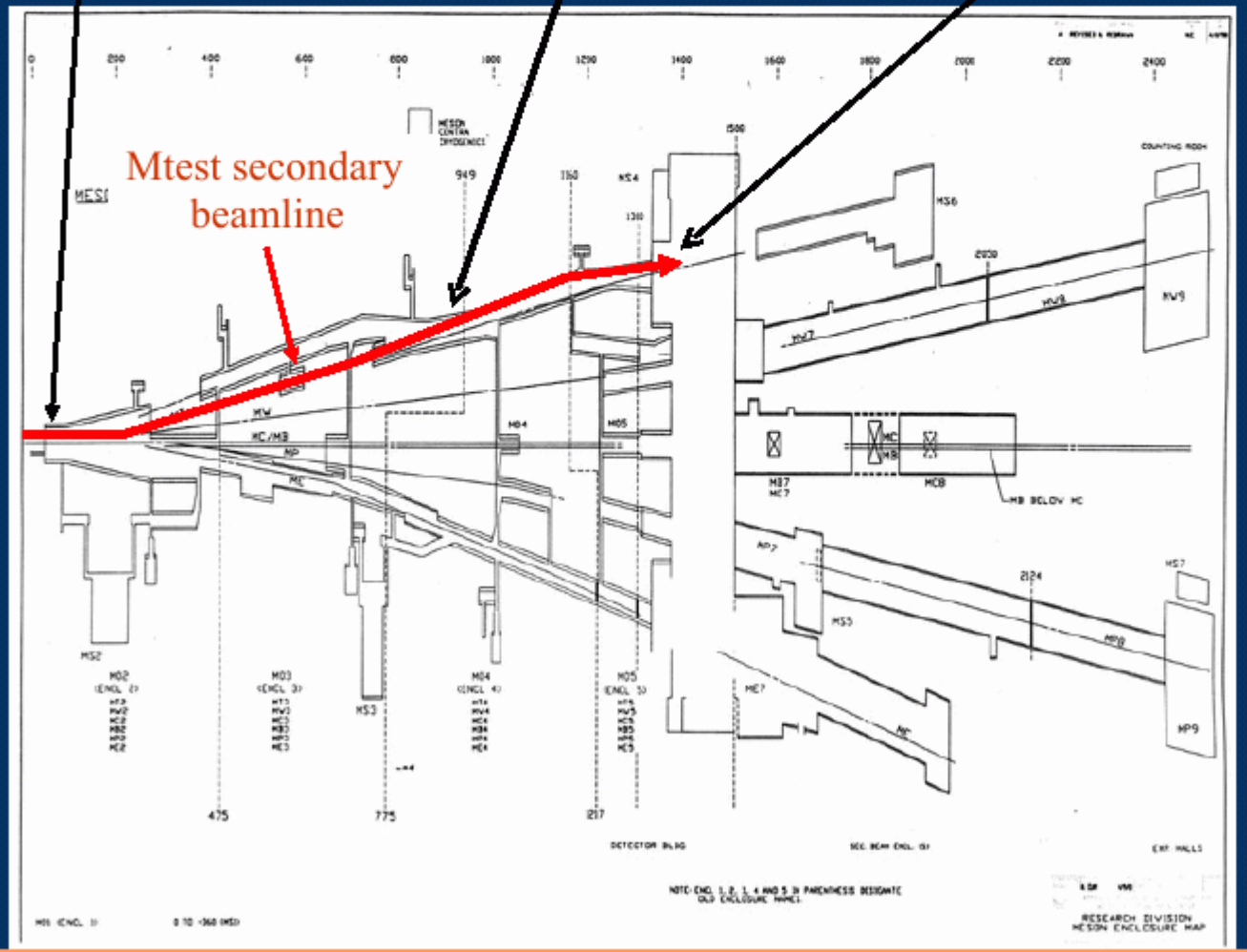
- Beam is created by a primary Proton beam of 120 GeV/c

Test Beam Layout and Modes

Movable upstream 30 cm Al target

Movable downstream target location

Meson Test Beam Facility



Proton Mode: 120 GeV protons transmitted through upstream target

Pion Mode: 8-66 GeV beam tuned for secondaries from upstream target

Low Energy Pion Mode: 1-32 GeV beam tuned for secondaries from downstream target

Picture courtesy of V. Zutshi

CALICE Testbeam at FNAL

- Installation Phase: 7/4/08 – 25/4/08

- Commissioning Phase: 28/4/08 – 7/5/08

- “Physics Runs” Phase: 7/5/08 - 27/5/08

General Running Conditions:

- Day operation – Beam between ~6m and 6pm
- Testbeam delivery interrupted by “Shot Setup”
  for TEVATRON experiments ~2 hours during our running
- No major machine downtime
  Some failures towards the end of the running
  Compensated by two extra half days on 26/5/08 and
  27/5/08 – Running 6am – 12pm
  Agreement on short notice

FERMILAB provides excellent support for our running

- see above
- e.g. Extensive help during (non trivial) setup of computing

Installation at FNAL – The Start

(1 container out of 3)

G. Mavromanolakis AEM Talk

Everything arrived on time and UNDAMAGED at FNAL

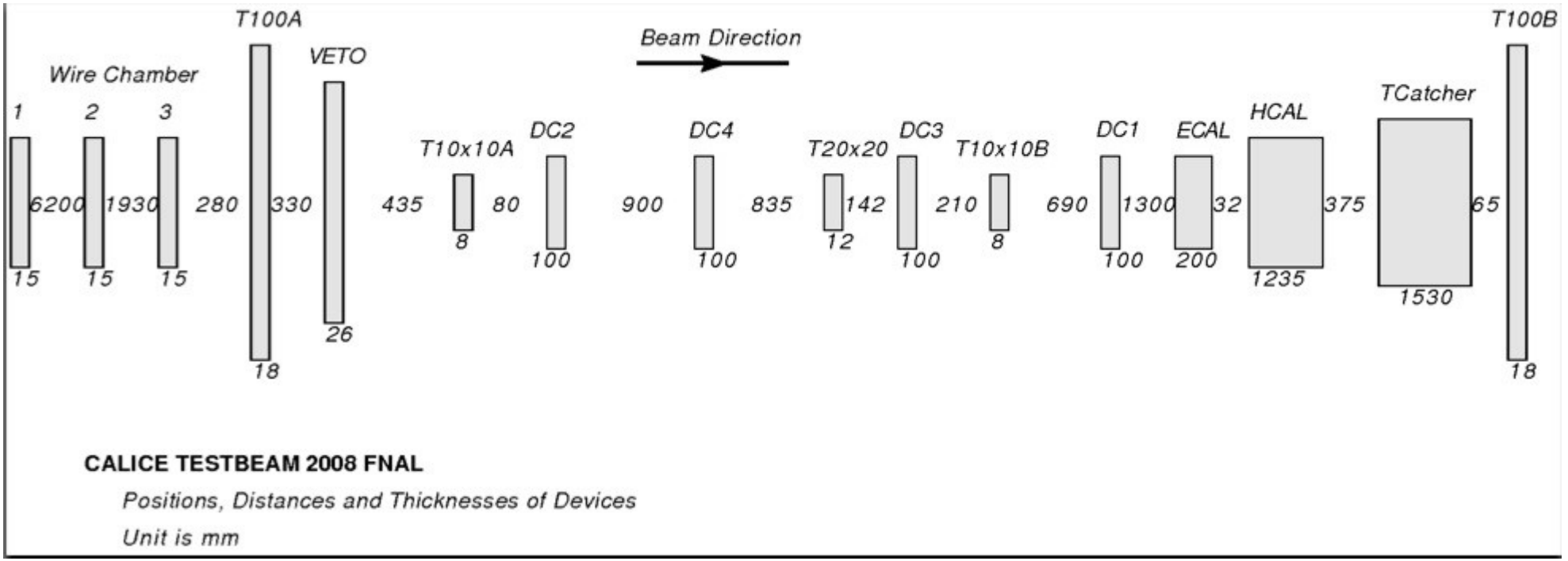
Detector Installation

- Equipment ready by 25th of April – Ready to accept beam on the 29th of April

- Setup – Combined effort of DESY, Uni Heidelberg, NIU, LLR, LAL and FNAL

- Setup comprises SiW Ecal, Ahcal and TCMT
  plus beamline equipment

Sketch of the beamline



A.Kaplan, H.Li

Experimental Control

- Live demonstration (planned)
  Place yourself to
  http://calice-cam01.fnal.gov:8080
  http://calice-cam03.fnal.gov:8080

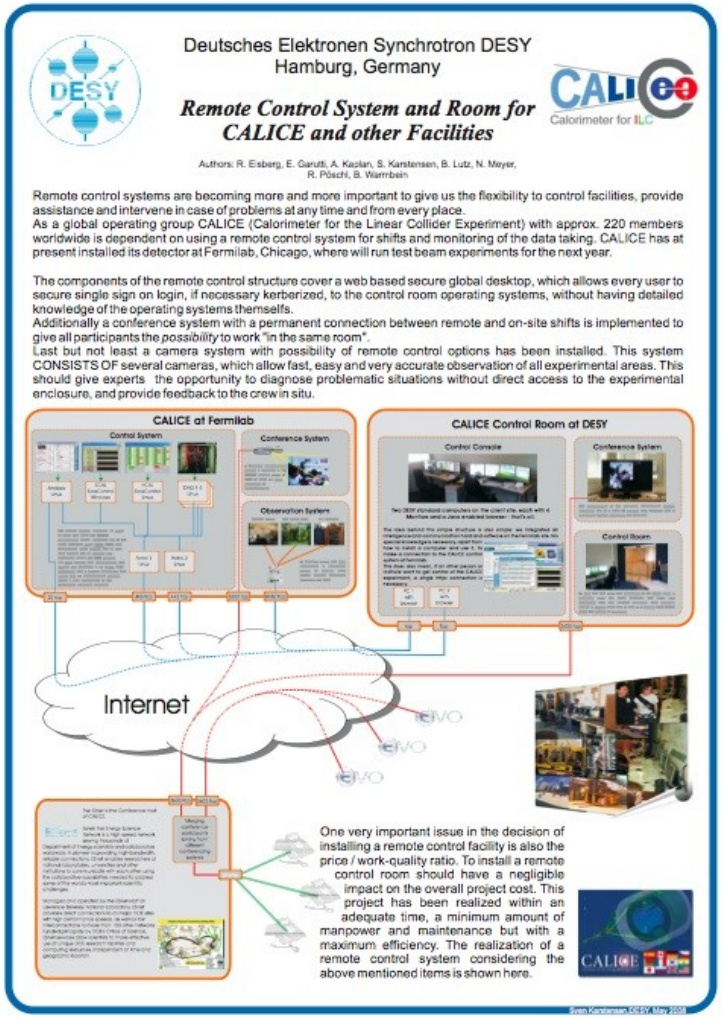
- Conferencing system

  - Daily operations meeting
  - Regular communication between calice control room at FNAL and 2nd Control room at DESY or colleagues elsewhere in the world

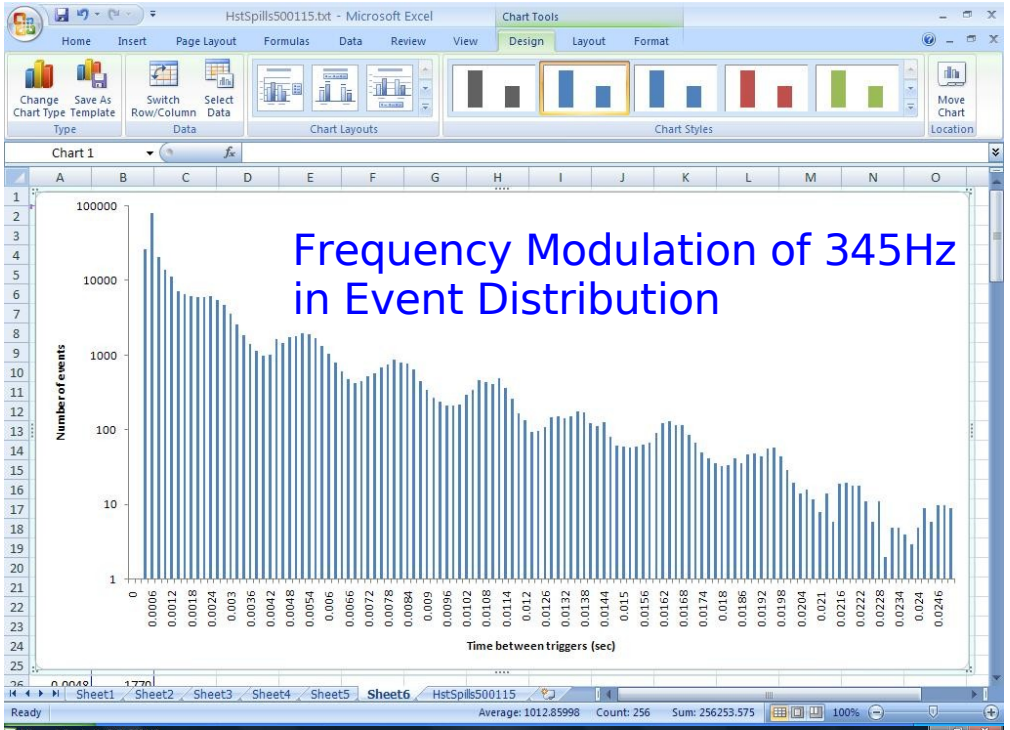
- Portal service (live demonstration planned)

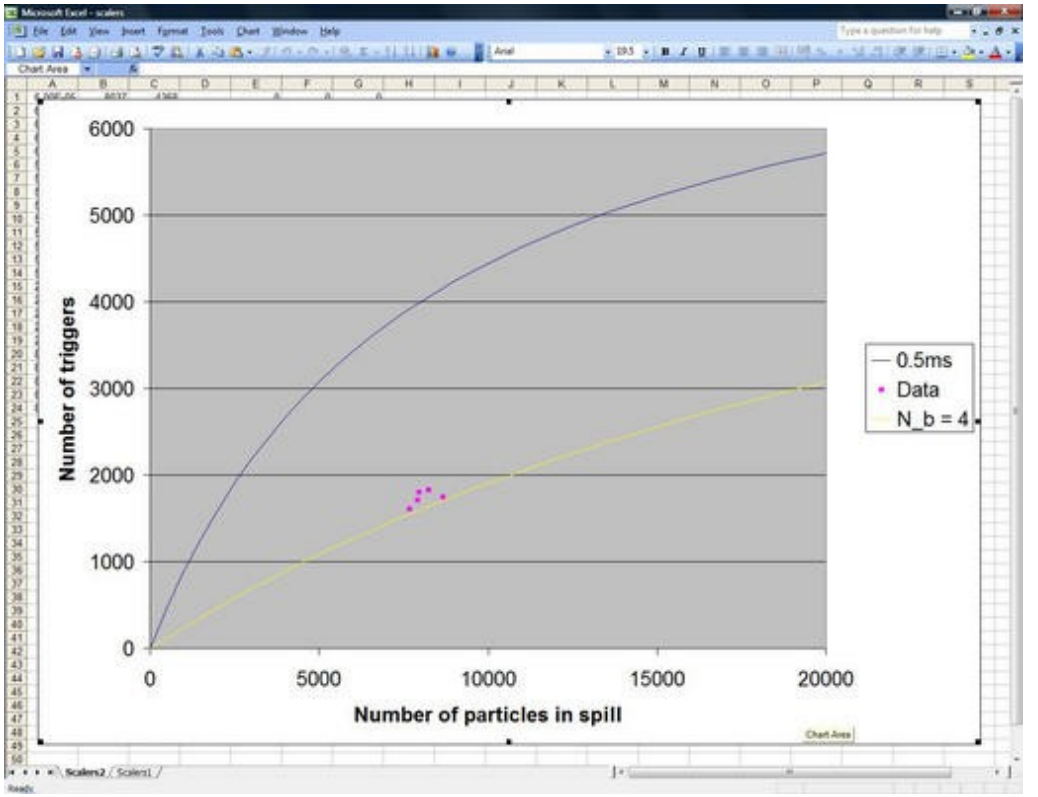
  https://calice-portal01(2).fnal.gov

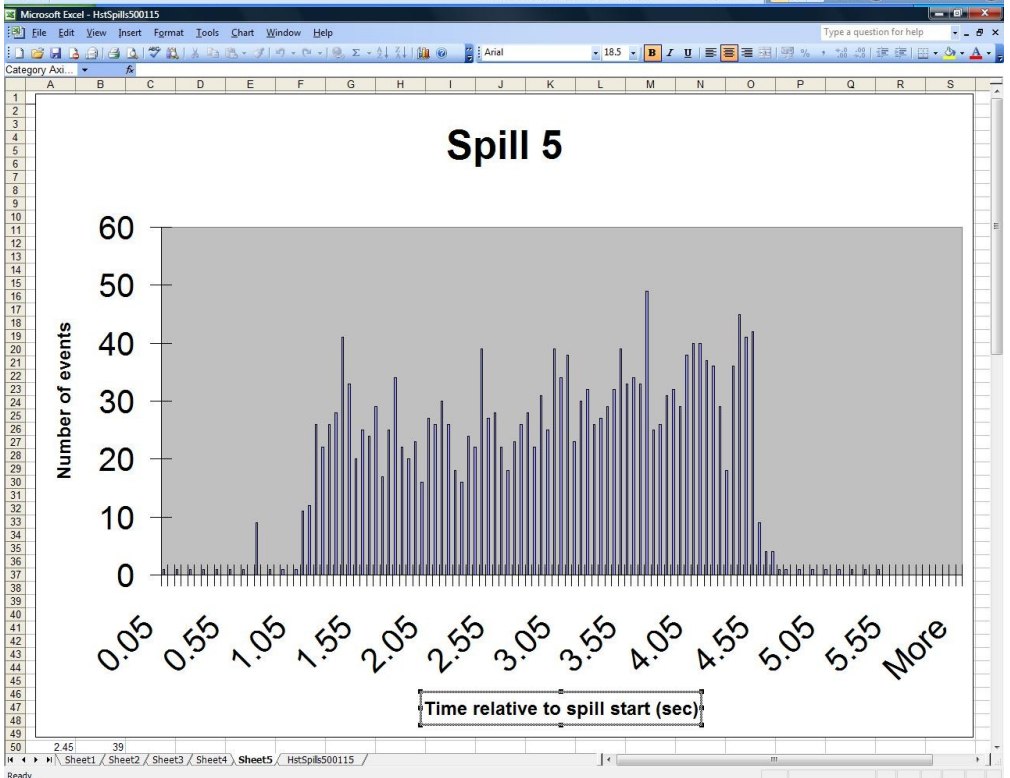
CALICE has implemented a first GDN foreseen for future ILC (and beyond) experimentation
Main responsible Sven Karstensen (DESY)



Beam Bursts







- DAQ Deadtime ~0.5msec
- DAQ Buffer Limit 2000 Events
- Bursts reduce efficiency of Data Taking

The FNAL Beam

Results from G4Beamline Simulation of MTest

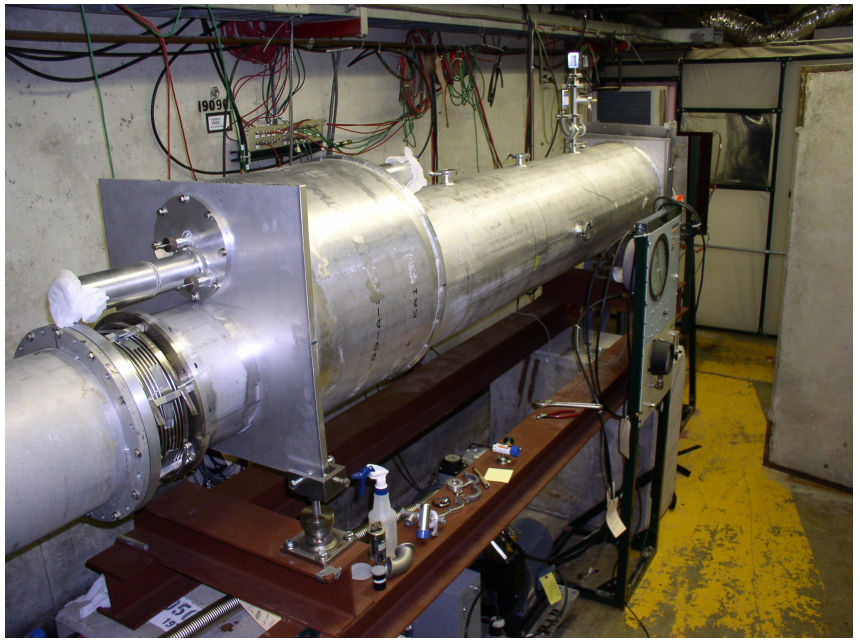
Energy	Lead (mm)	#pions	#electrons	Ratio
1 GeV	0	710	9990	0.07
	0.5	15	129	0.12
	1	8	43	0.19
	2	5	6	0.83
	5	2	5	0.4
2 GeV	0	2440	9990	0.24
	0.5	200	486	0.41
	1	88	158	0.56
	2	46	27	1.71
	5	10	1	10
4 GeV	0	5030	9990	0.5
	0.5	1198	1585	0.75
	1	671	548	1.2
	2	308	110	2.8
	5	109	2	55

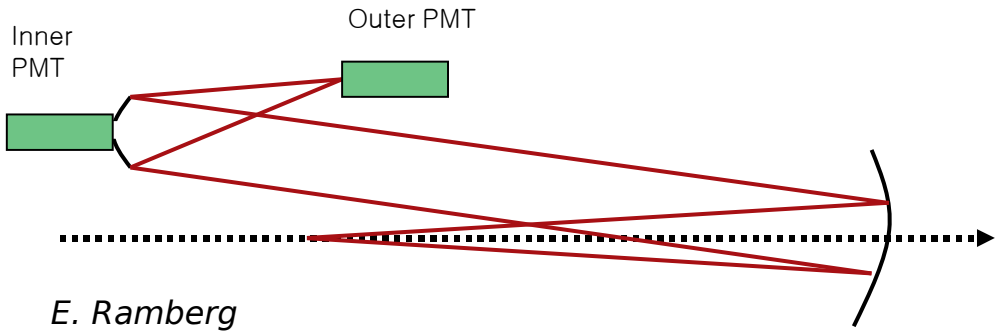
E. Ramberg, T.Rinn

Low rates at low particle energies

New Differential Cerenkov counter

20m Upstream of Calice Detectors





E. Ramberg

Win Baker* copied design used succesfully in MIPP

Jim Kilmer in charge of construction

Counter commissioned just before CALICE arrival

Timing of signals is just fast enough to be included in CALICE trigger

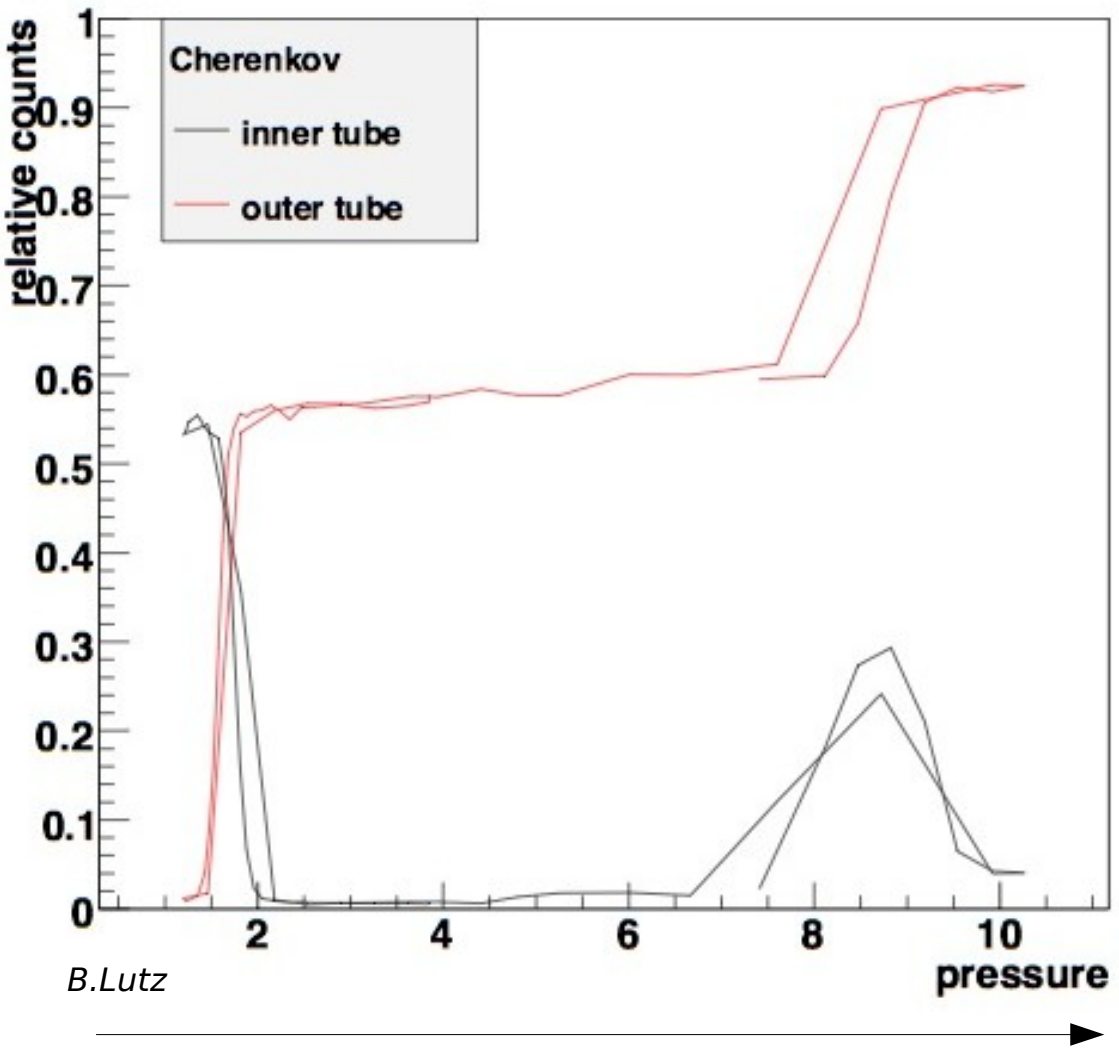
"Inner PMT" - accepts light near threshold

"Outer PMT" - accepts light from plateau region

"Inner x OutBar" - highly specific as to particle species

Inclusion of Cerenkov Counter in Trigger to create "pure" (pion) samples

Cerenkov Pressure Curve



Electrons

Pions

Increasing refraction index of Cerenkov Gas

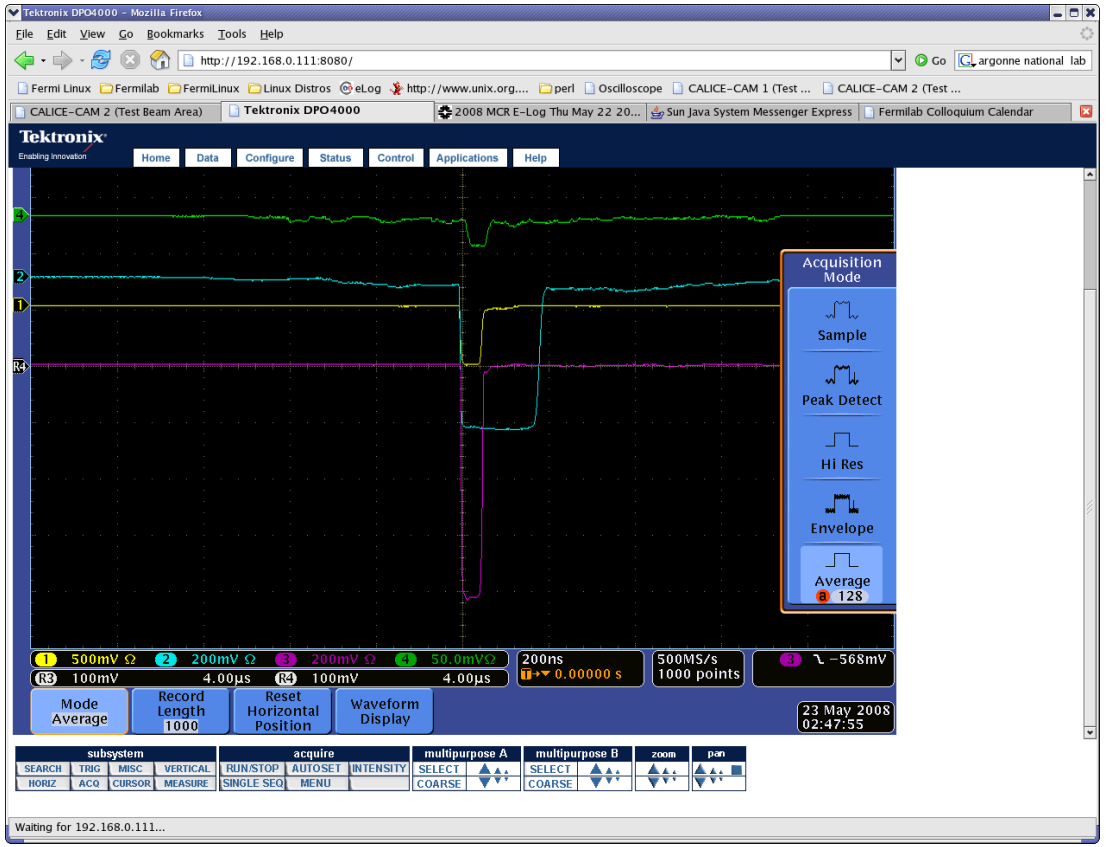
Regular recording of Cerenkov Pressure Curve
Cerenkov Pressure in Calice Data Stream

Timing of the Cerenkov Trigger

E.Garutti, B.Lutz, A.Kaplan, V. Zutshi

Due to finite propagation time Trigger Signal from Cerenkov arrives ~60 ns (~10 DAQ clock ticks) after the '10x10 coincidence' – Trigger 'working horse'

- 10x10 Trigger signal has to be delayed



Example of Coincidences between:

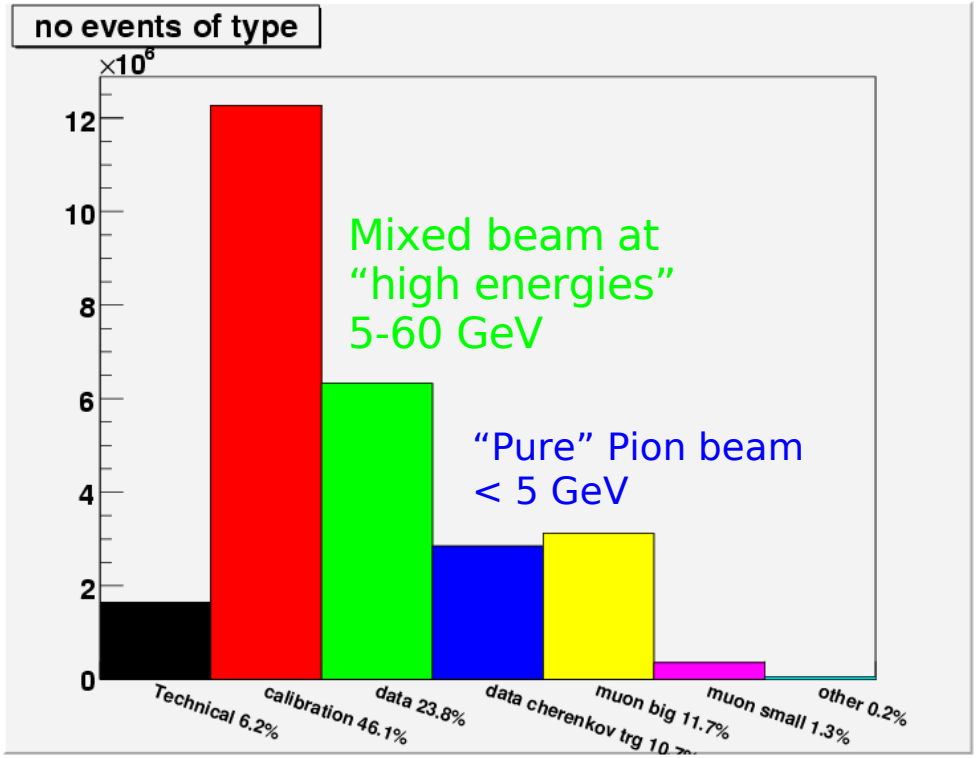
10x10A 10x10B
Cerenkov
100x100B (Muon Trigger)

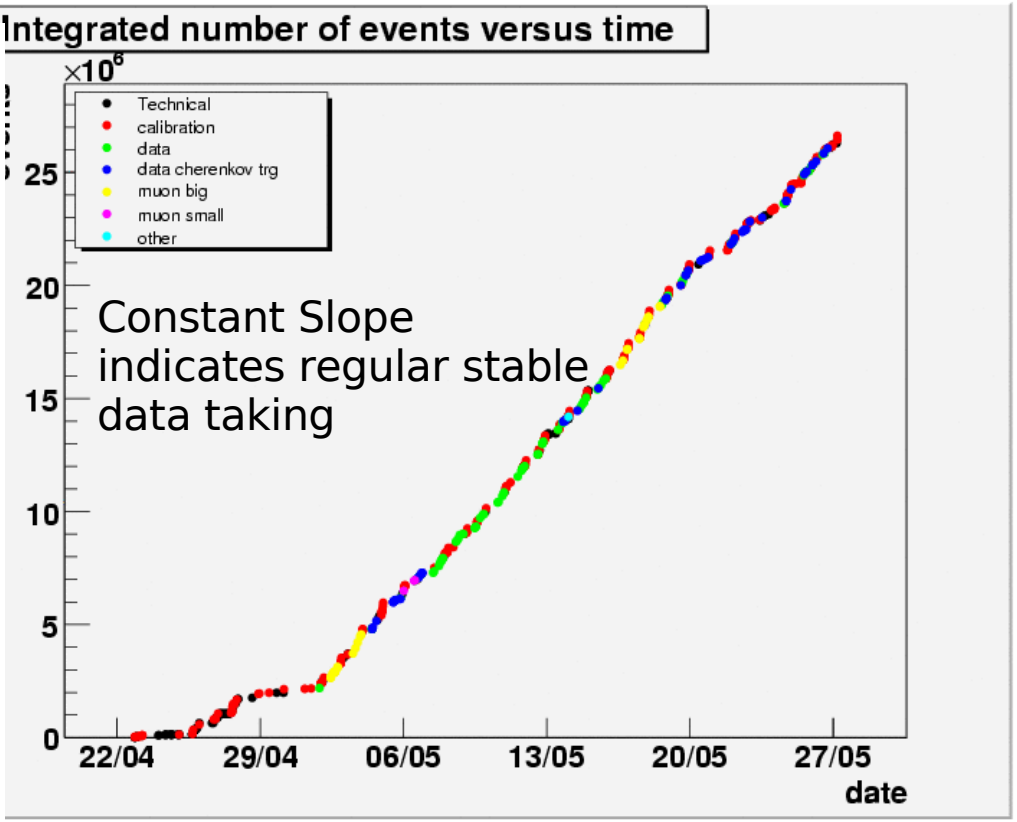
Trigger Mix lead to “pure” pion sample at ~200 Events/Spill
Partially large muon contamination

- Particles propagate faster than Cerenkov Signal
- Trigger Latency and details of signal formation in Calice Front Electronics

⇒Risk to record detector signal in falling slope (Discussed by Hengne and Marcel

“Luminosity” - Recorded Data





- Data sets with translated (5 points with 3cm horizontal distance) and rotated 10° and 30°
  Detectors
  Rotation worked fine apart from a few hickups (“Kinderkrankheiten”)

Calice Shift Plan May 2008

	May 08	May 09	May 10	May 11	May 12	May 13	May 14
19:00-06:00							
06:00-12:30							
ECAL	M. Reinhard	M. Reinhard	M. Reinhard	M. Reinhard	M. Reinhard	M. Reinhard	M. Reinhard
HCAL	N. Feege	N.Feege	N.Feege	N. Feege	N.Feege	N. Feege	N. Feege
analysis	N. Meyer	N. Meyer	N. Meyer	R. Fabbri	R. Fabbri	R. Fabbri	R. Fabbri
12:30-19:00							
ECAL	J. Puerta	J. Puerta	J. Puerta	J. Puerta	J. Puerta	J. Puerta	F. Morisseau
HCAL	B. Lutz	B. Lutz	B. Lutz	B. Lutz	G. Eigen	G.Eigen	G.Eigen
analysis	J. Repond	J. Repond	L.Xia	L. Xia	F. Simon	F. Simon	F. Simon

Remote Shifts from DESY

	Thursday May 15	Friday May 16	Saturday May 17	Sunday May 18	Monday May 19	Tuesday May 20	Wednesday May 21
19:00-06:00							
06:00-12:30							
ECAL	B. Mustapha	B. Mustapha	B. Mustapha	B. Mustapha	L. Morin	L. Morin	L. Morin
HCAL	H. Li	H. Li	N. Wattime	N. Wattim	N. Wattime	N. Wattim	P. Dublet
analysis	O. Wendt	N. D'Ascenzo	N. D'Ascenzo	N. D'Ascenzo	E. Garutti	E. Garutti	E. Garutti
12:30-19:00							
ECAL	F. Morisseau	F. Morisseau	F. Morisseau	F. Morisseau	F. Morisseau	F. Morisseau	F. Morisseau
HCAL	G. Eigen	J. Zalesak	J. Zalesak	J. Zalesak	J. Zalesak	J.Zalesak	J.Zalesak
analysis	F. Simon	F. Simon	F. Simon	L. Xia	B. Mustapha	B. Mustapha	B. Mustapha

	Thursday May 22	Friday May 23	Saturday May 24	Sunday May 25	Monday May 26	Tuesday May 27	Wednesday May 28
19:00-06:00							
06:00-12:30							
ECAL	L. Morin	L. Morin	L. Morin	L. Morin	L. Morin	L. Morin	
HCAL	S. Magill	S. Magill	G. Wilson	S. Magill	G. Wilson	G. Wilson	
analysis	E. Garutti	O. Wendt	O. Wendt	O. Wendt	S. Richter	S. Richter	

E.Garutti

Broad Participation in Shifts – (Once more) a great pleasure

Apologizes to those not appearing in the screen shot

Summary and Conclusions

- First Successful New Steps in the New World
  Citation E.Ramberg: “You showed me things about the beam I wasn't aware of”
  “You guys can be poud of your experiment”
  “You brought in the equipment I was waiting for”

```
Dear Erik and George et al,
Thanks for giving presentations on the Testbeam infrastructure and
                  the CALICE results.

                  They looked great! And I would like to congratulate and
                  thank every one of you who was involved in this effort.


                  All the very best,
                  Young-Kee
```

- Steep learning curve on how to take data and work in Fermilab environment
  Strong support by Fermilab

- Commissioning of experimental setup parallel to data taking
  Handling of Cerenkov Counter
  Trigger Latency
  Improvements by fast HERA-B PMT (Idea of Beni)

- Still already lots of interesting data on tape

- Let's draw the right conclusions for the July Running
  9/7/08 – 29/7/08 (or longer)