ADDENDUM from CALICE collaboration

To the PRC –DESY

1. Introduction

This addendum is dedicated to give the latest news and status after the report release in June for the review at DESY.

2. ECAL silicon tungsten (EUDET)

The progress on the new generation prototype is made in the framework of the EUDET program. The goal is the construction of this new prototype for the end of 2009. The main dimensions are fixed and have been checked by simulation. The W plates have been order. A first sample of silicon wafers have been order to Hamamatsu photonics, in order to perform the first set of test. Several technological issues have been chosen, but still need to be validated, such as the HV connection and wafer decoupling, the guard rings design, the thin "stitchable" PCBs with embedded VFE chips. The power pulsing, the thermal behavior, or the coherent noise has also to be work on. All the elements of the puzzle are supposed to take place in 2008 in order to produced and build the detector between the end of 2008 and the mid of 2009.

3. Status of the SCECAL (Scintillator) Electromagnetic Calorimeter

3.1 Study of the MPPC (Phonton Sensor)

Various tests have been performed and understanding is in progress.

The unexpected good linearity found in the test beam results is understood by its rapid nature of the signal recovery as follows. We have looked into the signals carefully and found the pulse heights of the after-pulse, which occurs in the same pixel after some time delayed (say 10ns). The after pulse is supposed to be caused by the lattice defect, where the avalanche electron being trapped and re-emiited after the first avalanche. The re-emitted electron makes another pulse called after pulse. The pulse height of those after pulse depends on the recovery of the bias voltage, which has time constant. The oscilloscope measurement of one pixel firing signal verified this expectation as shown in figure 1, where the recovery time is calculated to be 4ns. We have tested this fast recovery by using two lasers which emit light in short time delay. Here we have tested under fully firing pixel condition. The result is consistent with the oscilloscope measurement. This recovery time is proved by its resistivity change of the polycarbonate quencher by its temperature dependence.

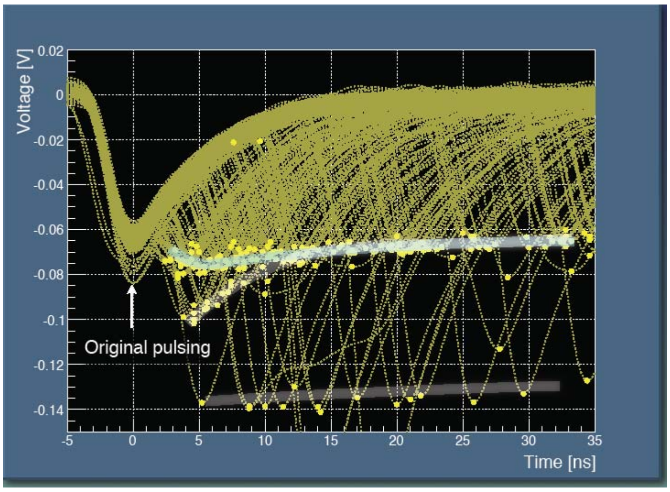

Figure1 : Oscilloscope signals of some single photoeletcron equivallent. There are triggered signals and after pulses whose pulse heights are smaller than the previous ones.

Since we have stably operated the MPPC of 702 pieces during the beam test at DESY for a month, we have corrected so much information on the statistical point of view on the MPPC. One is the temperature coefficients, which is shown in figure 2. The distribution shows quite uniform production of the photon sensors by Hamamatsu photonics company.

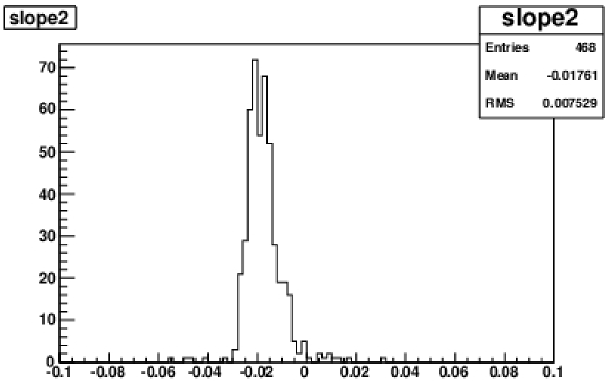

Figure 2 : The temperature coefficients distribution for 468 MPPCs in the SCECCAL detector. The average of the coefficients is -1.8%/degree and the r.m.s is 0.8%/degree.

3.2 <u>Prototype SCECAL</u>

At DESY we have tested a prototype SCECAL which consists of 18 strips/layer and 26 layers. Successful operation and stable performance make us analysis easy. The electron calibration has been performed quite straight forward.

One of the results, the energy resolution has a couple of % of the constant term which is understood by the lateral shower leakage with the simulation, since the detector size is 9cm x 9cm in its cross section.

We have tested three type of scintillator-strip sub-detector combinations, which were Kuraray scintillator and fiber readout and without fire readout which is called direct, and extruded scintillator which is produced in Korea. The difference between the scintillators is clearly seen by the MIP calibration depending on the hitting position. This is shown in figure 3 and 4. In figure 3, the energy resolutions of three types of three sub-detector combinations are shown. In figure 4, the response map against the MIP (3 GeV positron in this case) with three particular scintillator strips are shown. The extruded scintillator shows somewhat strong non-uniformity.

Calibration scheme

We are developing a monitoring system which consists of a clear acrylic bar and a LED. The figure 5 shows its schematic view. With 10 cm long clear acrylic bar, mother than 20 photo electrons are detected with uniform output along the bar. We will install this system for the physics prototype module at Fermilab.

At the Fermilab, we will construct four times bigger module than that of DESY and realize the feasibility of the SCECAL with pion calibration , as well as the reconstruction of pi-zero which will be produced by a target in front of the SCECAL.

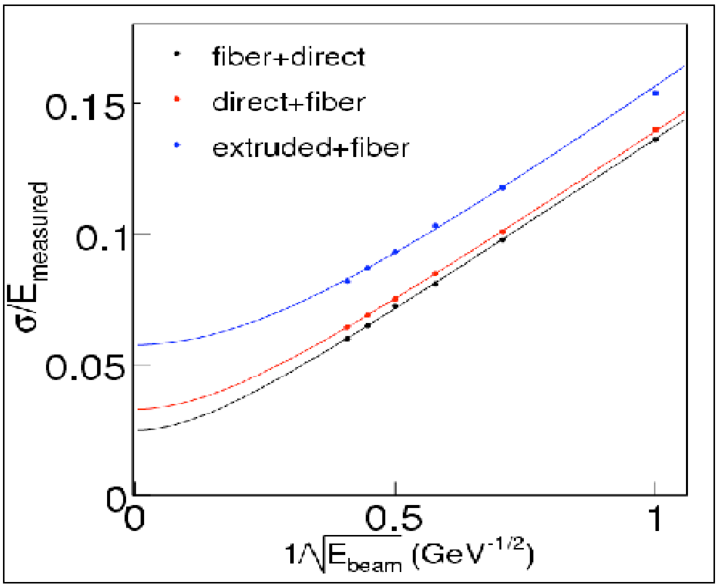

Figure 3 : the energy resolutions of three types of sub-detector which consists of fiber readout module, direct readout module and extruded scintillator-fibre module.

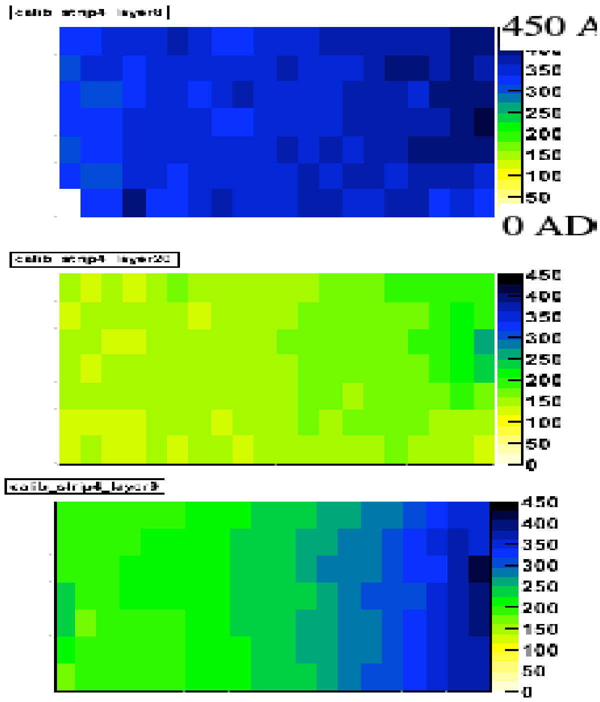

Figure 4 : maps of the mip response with ADC output with three typical strips, top : fiber readout with Kuraray scintillator, middle; direct readout with Kurary scintillator and the bottom : extruded scintillator with fiber readout.

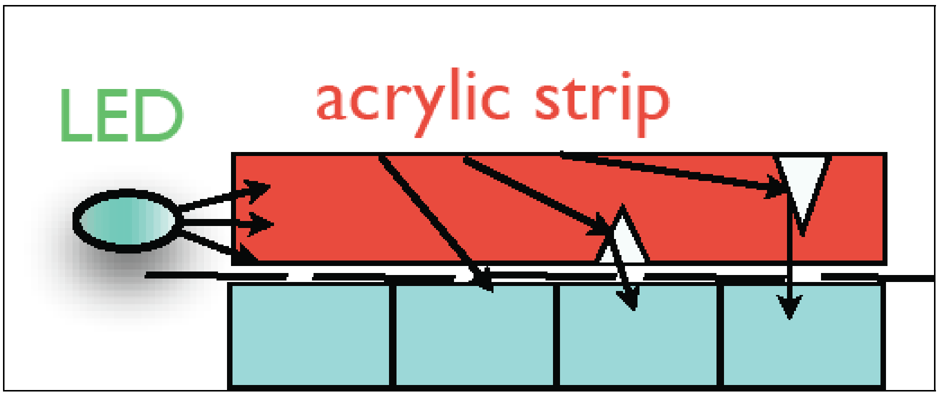

Figure 5: a schematic view of the monitoring system. The LED lights are transferred though the acrylic strip and get into each scintillator strips.

3.3 Plan for further study

Beam test

The physics prototype will be tested at Fermilab 2008 with combination of other CALICE HCAL. There, we aim the test at high energies to verify the saturation effect of the MPPC, charged pion calibration and the monitoring system, beside the usual measurement such as energy resolution, as well.

Since we found different behavior on the scintillators, we are going to perform a test at KEK beam line, which is newly constructed at KEKB, where we will measure the position dependence of the MIP response of different scintillators. We employ the extruded Korean scintillators as well as Kuraray.

Development of MPPC

Smaller package is now available from Hamamatsu Photonics Company, so that we can test it with the point of the stability and robustness. Improved version of next generation MPPC will be produced in couple of months, test and feedback are necessary to improve it. Understanding of the MPPC is also a relevant work for us.

Physics performance

Clustering algorithms is under development to fulfill the physics requirements in the jet environments, so as to achieve the better jet energy resolution and the PFA performance.

4. Scintillator HCAL development

Since LCWS2007, the main emphasis in the scintillator AHCAL effort has been on carrying out and supporting the CERN test beam data taking. Apart from a strong presence on the experiment site, fast analysis feedback has been instrumental for the success of the operation of the detector, of which major parts have just come out of the production line for the 2007 run period.

In parallel, it was possible to progress towards the development of a next generation realistic technical prototype. The goal is, as outlined in the LCWS07 report, to design and build a compact HCAL structure which can be scaled to a full ILC detector, to find solutions for the integration of the readout electronics into the detector volume whilst minimising the thickness of the instrumentation gap The ASIC and DAQ developments are described elsewhere; we focus here on the progress on integration issues.

The present view on the layout of electronics is shown in Figure 1. The HCAL layer is subdivided into PCBs (HCAL base units, HBUs) of manageable size, here 4 front end ASICs read and digitize the signals from 36 tiles each. The electronics at the layer end, which is accessible for maintenance, is conceived in a motherboard – daughterboard manner, which facilitates independent development in different groups for DAQ interface, calibration control and power distribution. After definition of the ASIC prototype (SPIROC) in June, signal routing has started, and mechanical and DAQ integration are already providing important feedback to front end and DAQ interface development, taking connectivity and redundancy issues into account.

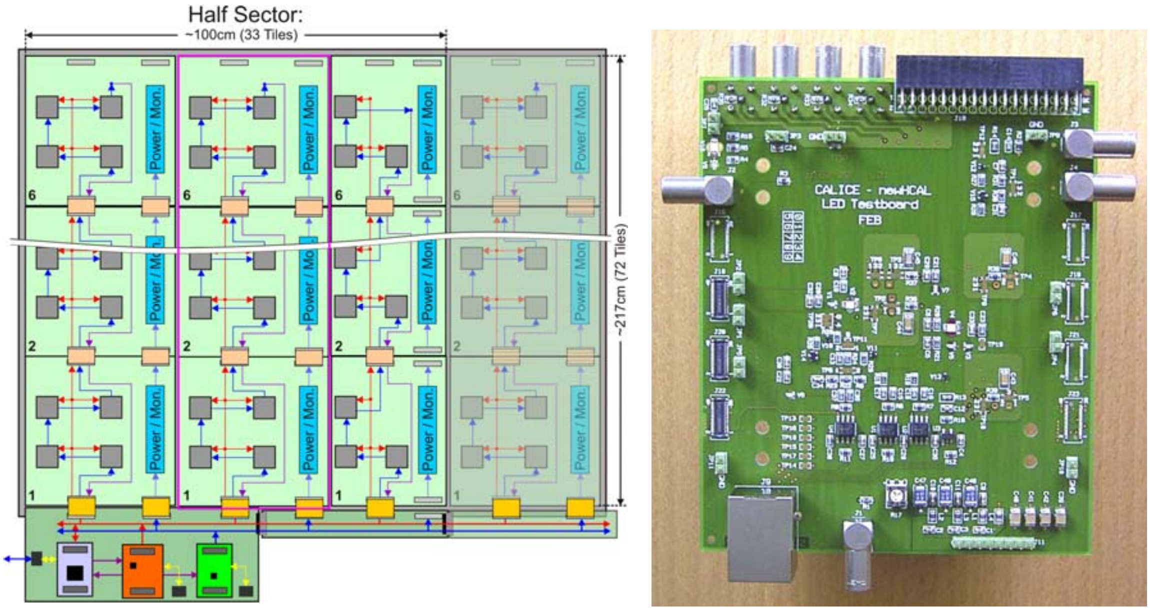

Figure 1 Left: Layout of an HCAL layer with embedded read-out electronics. Right: LED calibration test board.

Several smaller prototypes are underway in order to validate different aspects of the design. The distribution of calibration signals is still an open issue. It has been proposed to replace the optical signal distribution by a concept where LEDs are integrated in the PCB and directly illuminate the tiles. This becomes possible if thanks to the auto-calibration capabilities of the photo sensors the light intensity does not need to be precisely controlled. A test board following this approach has been built (Figure 1), and first measurements show that electronic cross-talk from the LED driver to the readout is negligible. Further studies are need, and the final concept will also depend on the development of optimal correction procedures for the already taken test beam data. A new driver for optical signal distribution is being developed in parallel in Prague, with emphasis on minimizing electromagnetic interference.

Next, a first HBU prototype will test the integration of readout ASIC, calibration system, photo-sensor, and scintillator tile into the PCB. For this, a new design to align the tiles with respect to the PCB by means of positioning pins has been developed at ITEP. A third "long" prototype shall be used to assess the stability of the power distribution and the signal integrity in a 2.2 m long structure.

In 2009, at least 12 HBUs should be produced to instrument a full layer, or a stack large enough to contain electromagnetic showers, such that the technical functionality can be validated with realistic power load and signal density. First samples of next generation Russian photo-sensors to be used in these structures have become available and have shown superior performance in tests at ITEP, other sensor types and scintillator sensor configurations can be tested with the same electronics. Once the performance of the time-resolving readout electronics is established, we plan to proceed to instrument an HCAL prototype, in order to test the use of time information for shower reconstruction.

The mechanical design of the absorber structure has just started. As a first step, the design of the HCAL in the TESLA detector is being re-evaluated. This is a very ambitious approach with minimized dead material ("cracks"), which needs to be scrutinized by more realistic finite element calculations and small prototype tests of critical parts. A sub-section of a module needs to be built by 2009 as well, in order to establish the mechanical interplay of the active layer with the absorber structure.

The AHCAL effort continues to attract new collaborators from Germany and abroad. In 2006, two Japanese groups (Kobe and Shinshu universities) working on the scintillator technology entered the collaboration, in 2007, the University of Heidelberg and the Max Planck Institute, Munich, have joined, University of Wuppertal is planning to follow soon. It is foreseen that the German groups in particular work in close collaboration with DESY on electronic and mechanical aspects of the detector design and prototyping as well as in the test beam data analysis. The exact task sharing is still being worked out.

We are asking DESY to continue its strong support with scientific and technical resources to provide a basis for integrating the activities of our national and international partners.

5. Digital HCAL

The Digital Hadron Calorimeter (DHCAL) group completed its R&D with (multi-bit) analog readout of Resistive Plate Chambers (RPCs) and published the results in [1]. The next step involved the assembly and testing of a complete data acquisition system able to read out large numbers of channels at a reasonable cost (less than $2/channel). The system consists of a front-end ASIC (the DCAL chip with single-bit or digital readout), pad boards (containing the 1 x 1 cm^2 pads), front-end boards (housing the DCAL chip and glued on top of the pad boards), data concentrator boards (located to the side of the active layer), data collector boards (a VME-based data collection system) and a timing and trigger module (also located in the VME crate). For the purpose of testing the readout chain, the group built 10 RPCs (each with an area of 20 x 20 cm^2) and 1 Gas Electron Multiplier (GEM) chamber. The chambers were assembled in a hanging file configuration and were extensively tested with cosmic rays and in the Fermilab test beam. The active layers were interleaved with 20 mm steel and copper plates to incite the development of showers. The prototype calorimeter counted up to 2,300 individual readout channels.

Figure 1. Photograph of the device

Figure 1 shows a photograph of the Fermilab test beam setup. Over a period of approximately three weeks the group collected calibration data (muons), and electron or pion enhanced samples in the energy range between 1 and 16 GeV. In addition, for establishing the chamber's rate capability, 120 GeV proton data without absorber plates were collected at various beam intensities. Figure 2 shows an event display of a clean muon track traversing the prototype calorimeter, showing single pads firing along the track direction.

The calibration data is being used to measure the MIP detection efficiency and the pad multiplicity. Figure 3 shows and example of such a measurement obtained while operating the stack at a given high voltage and setting the threshold to a given value uniformly across all layers and channels.

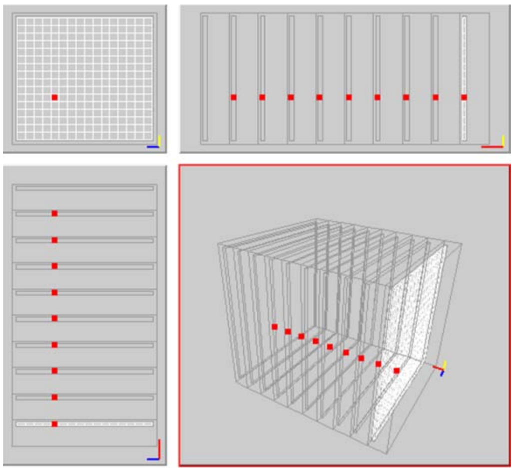

Figure 2. Event display of a muon track

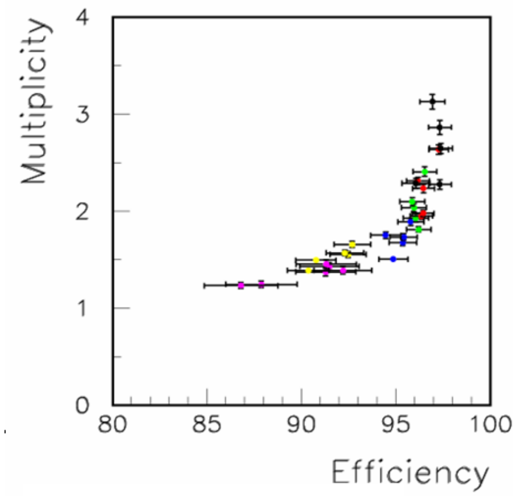

Figure 3 : Pad multiplicity versus efficiency

The present stack being about one interaction length deep was too small to contain hadronic showers, but could nevertheless provide an adequate response to electrons. Figure 4 shows the sum of hits over all layers in response to 2 GeV electrons, as identified by an upstream Čerenkov counter. The peak of the distribution has a width of ~440 MeV, corresponding to a resolution of about 30%/√E(GeV). This result validates the novel approach of calorimetry with digital readout and encourages the group to proceed with the planned construction of a 1 m^3 physics prototype. The latter will provide precision measurements of hadronic showers and further our experience with gaseous active elements. After a short interlude involving a redesign and simplification of the pad- and front-end boards, the group will initiate the construction of the 1 m^3 physics prototype. The latter will count of the order of 400,000 readout channels. More details on the project can be obtained from [2] and the links therein.

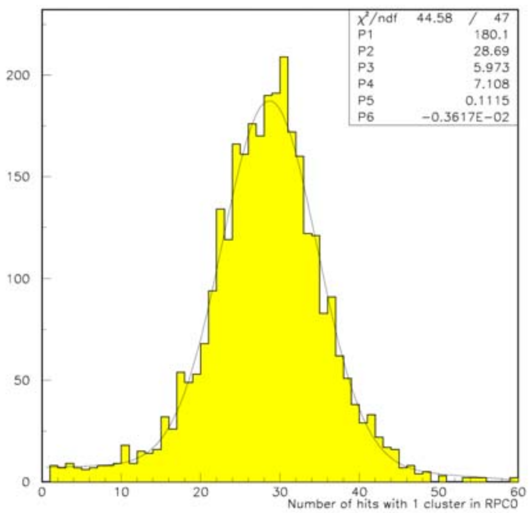

Figure 4. Response to 2 GeV electrons

References

[1] G.Drake et al, Nucl. Instrum. Meth. **A578** : 88-97, 2007.

[2] www.hep.anl.gov/repond/DHCAL_US.html

In paralell , European groups have started a study to go directly to future technology for the final detector. This E-DHCAL has achieved its first goal by designing and realizing a readout electronics board hosting 4 of the 64-channel hardroc chips mentioned before. An acquisition system was developed using a USB device. The board is the first realisation of the second generation electronics to be embedded on the detector. The whole system is under test but the first results show that it works as expected. Both digital and analogue readout were developed in this version in order to study the digital readout performance with respect to the standard analogue one. The latter is the one currently used by the other CALICE detectors. The board will be soon associated to both GRPC and MICROMEGAS detectors. A mechanical setup able to host up to six detectors is built and will be used for a test beam exposure at DESY expected in November 2007. The detectors that will be used for this setup are currently under construction in Russia and in France.

The next step will be the construction of large size detectors and then to test them with beam exposure conditions in order to compare the different candidate detector and then select the best one.

Recently, the French groups working on the EDHCAL have obtained the necessary funding to equip the future technological prototype of 40 planes of 70X70 cm^2 each by the previous electronics. In collaboration with the Russian and Spanish groups they have started to design the technological prototype to be as close as possible to the ILC HCAL module.

6. Report on the CERN test beam

The Calice collaboration is involved in a major programme of R&D into calorimetry for the International Linear Collider (ILC). The aim of the project is to compare the performance of different technologies for electromagnetic and hadronic calorimeters in terms of ILC requirements in a common framework.

The main direction of the collaboration R&D is to study particle flow (PFA) calorimetry, software compensation and individual particle reconstruction. As such, the studies are concentrating on fine granularity calorimeters with a high degree of longitudinal segmentation. For this purpose, a very intense test beam programme is being undertaken for extensive tests of calorimeter prototypes.

Between June and August 2007 the Calice collaboration has successfully commissioned and operated a full chain of calorimeter prototypes in the H6B experimental area at the CERN SPS: electromagnetic calorimeter (ECAL), analog hadronic calorimeter (AHCAL) and tail catcher and muon tracker (TCMT) (Fig.1).

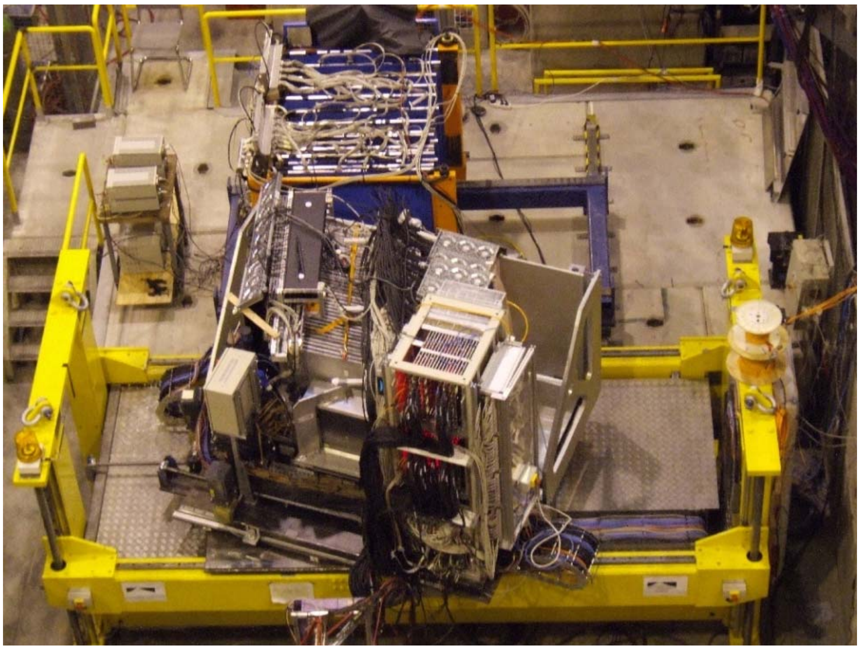

Fig.1: View of the Calice calorimeter prototypes installed in the H6B experimental area at the CERN SPS.

The beam line installation at CERN included locally provided beam detectors (multi wired proportional chambers – MWPC) and custom made scintillation detectors for the experimental trigger. A sketch of the experimental setup is shown in Fig.2.

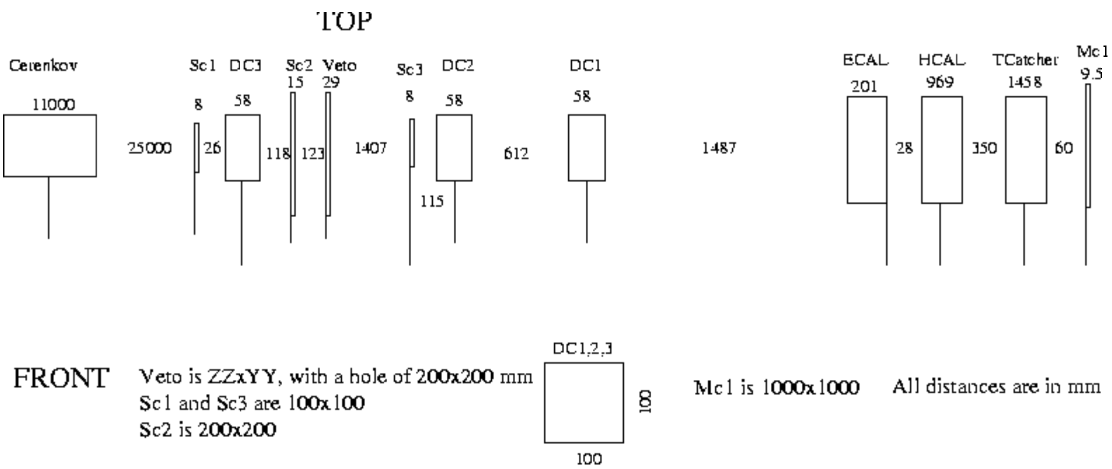

Fig.2: Sketch of the installation for the Calice test beam in the H6B area at the CERN SPS.

The trigger to the experiment is provided by the coincidence of two $10x10cm^2$ scintillator plates with photo-multiplier readout. In addition a coincidence has been equipped as a muon rejection wall downstream of the detector and as muon trigger during calibration. The analog readout of an additional $20x20cm^2$ scintillator plate serves as veto for events with double particles or showers initiated in the material upstream the detector. In order to tag the halo of the beam, an additional $100x100cm^2$ scintillator with a $20x20cm^2$ hole has been employed as an outer veto. All triggers are digitized and recorded event by event by the VME-based data acquisition (DAQ), and can be used offline for data selection. A threshold Cherenkov counter filed with helium gas has been used to discriminate electrons and pions, in the range 6-20 GeV. The same detector has also been used with nitrogen gas in order to discriminate pions and protons in the range 30-80 GeV. The gas pressure in the 11~m long Cherenkov vessel needs to be adjusted depending on the beam energy. With optimal settings, efficiencies of 90% are obtained, going to 30 % with increasing energy. The discriminated Cherenkov signal is recorded as a trigger bit.

For particle tracking, three sets of delay multi-wire proportional chambers provided by CERN have been included in the CALICE DAQ. Three pairs of x and y planes with two wires each are readout at the event basis by a TDC implemented in the DAQ. The spatial resolution of the tracking system is better than 200~µm.

The three calorimeter prototypes have been commissioned on the beam line.

The ECAL was equipped with 30 sensitive layers of silicon pads, corresponding to a total of 54 PCBs. The total readout channels have been of 9072, corresponding to 216 channels/PCB in the central part of the detector and 108 channels/PCB in the bottom part. The total radiation length of the prototype is $24X_0$.

A total of 38 fully commissioned modules of the AHCAL were installed on the beam line; 30 modules with fine granularity (216 scintillator tiles) and 8 modules with coarse granularity (141 tiles) were present. Each tile is readout by a silicon photo-multiplier (SiPM), for a total of 7608 readout channels. The total interaction length of the AHCAL prototype is 4.5λ.

The TCMT was completely installed with all 16 active layers fully instrumented and a total of 320 readout channels.

The system, with more than 16000 channels and an acquisition rate capability of 120 Hz (see Fig.3), is a compact HEP experiment in itself.

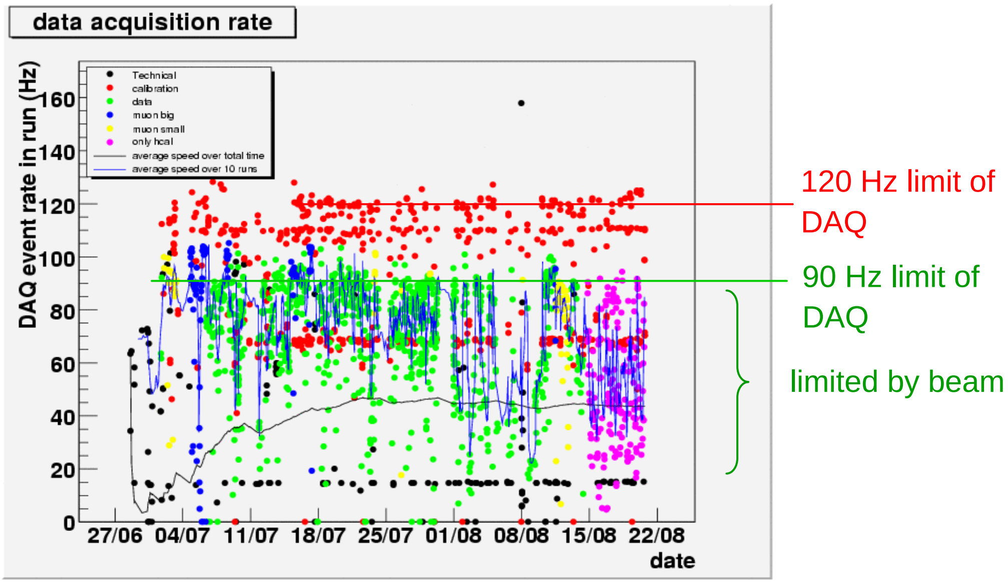

Fig.3: Data acquisition rate for the 2007 Calice test beam at CERN. The average acquisition rate (black line) is ~50 Hz.

During the data taking period, the CALICE detectors had more than 90% up-time, with a beam duty cycle estimated to be about 60% (see Tab.1). The SPS up-time has been excellent, and the beam was available for almost 80% of the total test beam time (7 weeks), as summarized in Tab.1.

Time since 5th of July	4 147 200 sec
14.4s super-cycle	2 389 798 sec
16.6s (20.4s) super-cycle	889 829 sec
Power cuts	86 400 sec
Summer students	57 600 sec
p/e/p data	1 790 698 sec
muons (100x100)	153 976 sec
muons (20x20)	131 752 sec
AHCAL only	365 195 sec
Calibration	318 447 sec
SPS uptime	79.1%
Beam controlled by H6B	76.1% (96.2% of uptime)
DAQ on beamData	62% (81.5% of beam in H6B)
DAQ on calibration	15.1%

Tab.1: Summary of the total data taking time for the 2007 Calice test beam at CERN.

The performance of all beam-line detectors as well as that of the 3 calorimeter prototypes has been monitored online during data taking. A special fast analysis tool has been developed to access in real time the relevant beam and detector qualities. This incredible success for the collaboration was only possible thanks to the combined effort of all the institute members. More than 50 physicists have shared shifts at CERN (see Fig.4). Experts in place and on-call have been permanently available during the three months of commissioning and running.

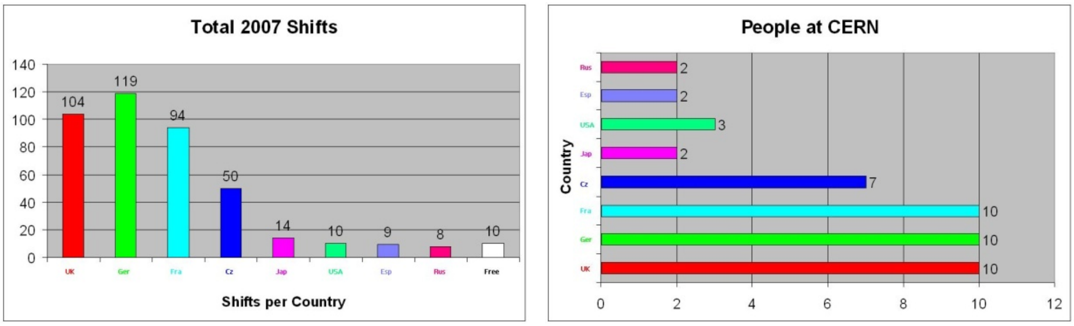

Fig.4: Total shifts and total number of people at CERN for the 2007 Calice test beam at CERN.

The programme for the test beam has been very intense and has been completely fulfilled at the end of the 7 weeks of data taking. The collaboration has collected more than 200 million events (see Fig.5), completing the muon calibration of all components, the electromagnetic program of both ECAL and AHCAL and hadronic program for the combined detector at four different incident angles of the beam (0, 10, 20 and 30 degrees).

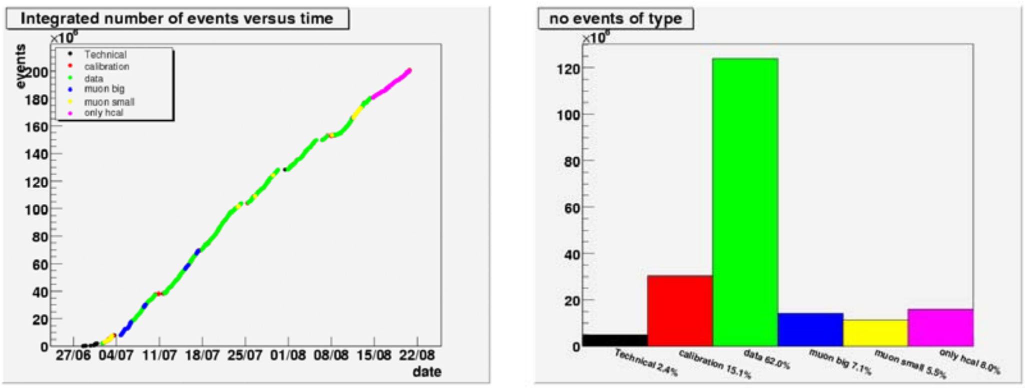

Fig.5: Total integrated luminosity collected at the 2007 Calice test beam at CERN (left). Data types collected during the 2007 Calice test beam at CERN: 62% of the collected data are e/π/proton interactions in the calorimeters.

Both ‘minus’ (e^-/π^-) and ‘plus’ (e^+/p^+/proton) beam events have been recorded. A full scan of the calorimeters’ front faces has been performed, as detailed in Fig.6.

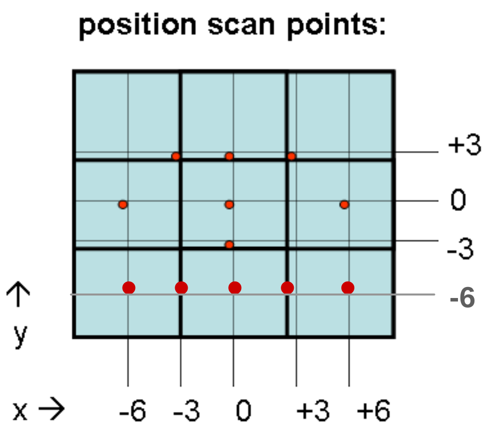

Fig.6: Summary of the position scanning on the front face of the ECAL performed at the 2007 Calice test beam at CERN.

An important part of this year's test beam has been the irradiation of a test ECAL PCB with embedded electronics, for a second generation prototype of electronics for the ILC. The irradiation has been performed using 70 GeV and 90 GeV electron beams, and doing a complete position scan of the four chips present in the test board, as shown in Fig.7. The test PCB has been inserted in the ECAL structure at the point of the shower maximum.

The most ambitious part of the test beam programme has been the rotation of the ECAL and AHCAL prototypes, with subsequent re-staggering of the active parts of the calorimeters. The incredible success of this part of the programme has been possible thanks to the movable stage on which the ECAL and AHCAL have been installed. This 16 tonnes structure, designed and built at Desy, allowed for the X and Y movement of all the calorimeters. Moreover, the ECAL and AHCAL have been mounted on a steel platform that could be rotated to a maximum of 30 degrees with respect to the direction of the beam. Data have been collected with the ECAL and AHCAL rotated by 10, 20 and 30 degrees with respect to the normal beam incidence direction.

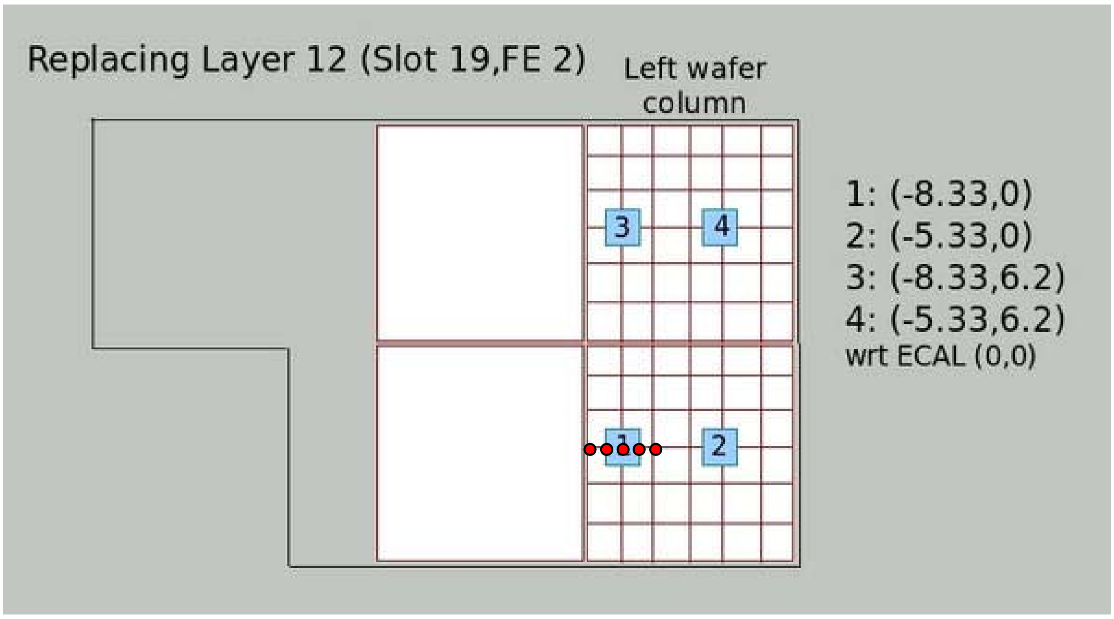

Fig.7: Sketch of the scanning of the test ECAL PCB with embedded electronics performed at the 2007 Calice test beam at CERN.

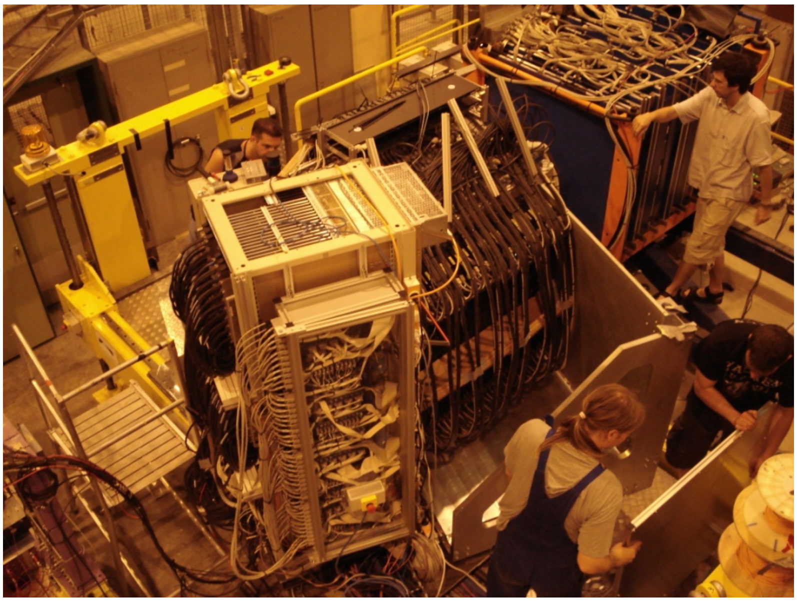

Fig.8: Experts performing the rotation of the ECAL and AHCAL to 20 degrees.

All data collected during the test beam where immediately processed and reconstructed using the Grid tools. The recorded runs were available from the Desy dcache to the whole collaboration within hours of being collected at CERN. A summary of the total number of runs collected and the total disk space occupied by the data accumulated at the 2007 Calice test beam at CERN can be seen in Tab.2.

Last run	33 1693
Number of runs	1 693
Combined runs to grid	1 693 (100%)
Converted runs to grid	1 693 (100%)
Disk space	8 274 GB
Disk space for converted runs	5 965 GB
Total disk space used	13 TB, 927 GB

Last run	35 0395
Number of runs	395
AHCAL runs to grid	395 (100%)
Converted runs to grid	395 (100%)
Disk space	598 GB
Disk space for converted runs	369 GB
Total disk space used	0 TB, 967 GB

Tab.2: Summary of the total number of runs collected during the 2007 Calice test beam at CERN for the combined ECAL+AHCAL programme (left) and the AHCAL only programme (right)

The final week of the test beam has been devoted to test the AHCAL alone, removing the ECAL from the stage. This has allowed performing important tests of the AHCAL response to both electrons and pions.

A detailed summary of the programme proposed in April at the Calice Technical Board and achieved at the test beam can be see in Tab.3, Tab.4 and Tab.5.

Thanks to the almost on-line reconstruction of the data collected, several checks have been possible to monitor the response of the calorimeters at different energies. The preliminary response for ECAL and AHCAL (with no calibration) can bee seen in Fig. 9.

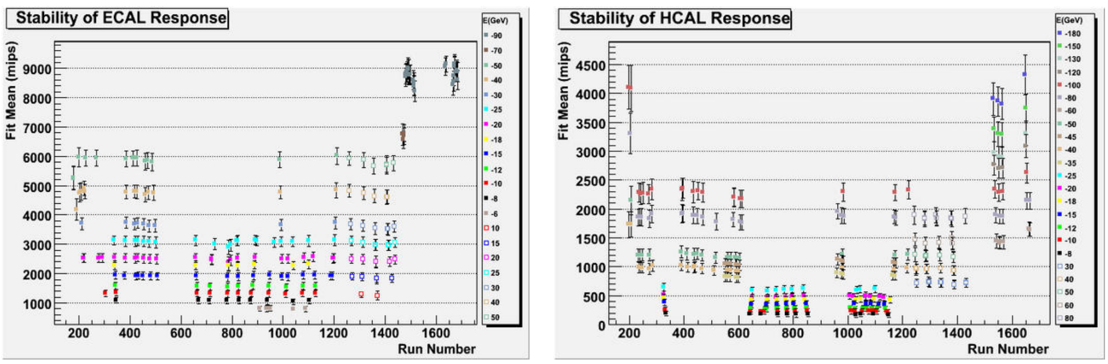

Fig.9: Preliminary results of the stability of ECAL (left) and AHCAL (right).

Conclusion

Between June and August 2007 the Calice collaboration has performed an extremely successful test beam at the H6B experimental area at CERN. More than 200 million events have been collected and all the data are available for analysis to the whole collaboration on the Grid.

	Proposed in TB plan (4 weeks of data taking)	Acheved at the TB (7 weeks of data taking)
Combined physics package: low energy π	π^-: 1M evts @ 6/8/10/12/15/18/20 GeV, 0 deg π^-: 500K evts @ 6/10/12/15/18/20 GeV; 10, 15, 20, 30 deg	- π^-: 1M evts @ 6 GeV, 0 deg; - 1.75M evts @ 8/10/12/ 15/18/20 GeV, 0 deg. - π^-: 400K evts @ 6/10/12/15/18/20 GeV, 10 deg; - 1M evts @ 6 GeV; 500K evts @ 8-20 GeV, 20 deg.
Combined physics package: high energy π	π^-: 1M evts @ 25/30/40/50 GeV, 0 deg π^-: 500K evts @ 25/30/40/50 GeV; 20, 30 deg	- π^-: 1.5M evts @ 25/40/50/60/80/ 100/120/130/150/180 GeV, 0 deg; - 200K evts @ 5/40/45/50/80/ 100 GeV, 0 deg: ECAL on beam line, AHCAL displaced by 6 cm. - π^-: 200K evts @ 35/40/45/50/ 80/100 GeV, 10,20 deg.

Tab3: Combined ECAL+AHCAL physics package for the Calice test beam proposed at the Calice Technical Board (centre column) and achieved at the test beam (right).

	Proposed in TB plan (4 weeks of data taking)	Acheved at the TB (7 weeks of data taking)
ECAL physics package: low energy e	e^-: 1M evts@6/10/15(/20), 0 deg	- e^-: 1M evts @ 6 GeV, 0 deg; ~700K evts @ 8/10/12/15/ 18/20 GeV, 0 deg. - 1M evts @ 6 GeV, 20 deg; ~400K evts @ 8/10/12/15/ 18/20 GeV, 10, 20 deg.
ECAL physics package: high energy e		- e^-: ~2M evts @ 25/30/ 40/50 GeV, 0 deg; - ~200K evts @ 25/30/ 40/50 GeV, 10, 20 deg.
ECAL physics package: high energy e		- e^-: scan of the bottom ECAL layer; ~250K evts @ 90 GeV/pos, 0 deg.
ECAL irradiation package: high energy e	e^-: 1M evts@10/50 GeV, 0 deg	- e^-: ~1.1M evts@70 GeV, 0 deg; - > 5.5M events @ 90 GeV, 0 deg. Position scanning on chip.
ECAL inter-alveolae package: high energy e	e^-: 300M evts@20/50 GeV, 0 deg	- e^-: ~2M evts @ 8/10/12/15/18/20/25/30/40/50 GeV, 0 deg; 6 positions.

Tab4: ECAL physics package for the Calice test beam proposed at the Calice Technical Board (centre column) and achieved at the test beam (right).

	Proposed in TB plan (4 weeks of data taking)	Acheved at the TB (7 weeks of data taking)
AHCAL only package: e/π, all energies	e/π⁻: 500-1M evts @ 6/10/15/20/25/30/40/50 GeV, 0 deg	- π⁻: 100K evts @ 8/10/12/ 15/20 GeV, 30 deg; - e⁻: 100K evts@6/10/15/20 GeV, 30 deg; - π⁺: 400K evts @ 10/15/20/25/ 30/40/50 GeV, 0, 10, 20, 30 deg; - e⁺: 400K evts @ 10/15/20/25/ 30/40/50 GeV, 0, 10, 20, 30 deg.
π⁺/e⁺/protons		- e⁺: 1.5M evts @ 10/15/20/25/30/ 40/50 GeV, 0 deg; - π⁺/protons 1.5M evts @ 30/40/ 50/60/80 GeV, 0 deg: position scanning on ECAL front face.

Tab5: AHCAL only and e^+/p^+/proton physics package for the Calice test beam proposed at the Calice Technical Board (centre column) and achieved at the test beam (right).

7. Conclusion

The collaboration, after a very successful summer of test beam as well as at CERN DESY than at FNAL, will proceed to analysis, papers. In parallel, progresses are made on the front of the design of the DHCAL (including full prototype) and alternative ECAL, such the one with Scintillator or the one with MAPS. For the historical device of AHCAL and tungsten-silicon ECAL, New generation of prototypes, much closer to the ILC like detector, are under design and R&D. In addition, the date of the LOI in 2008, put pressure on the collaboration to increase the relation with proto-collaboration detector groups. New support and funding to the collaboration will be mandatory to reach all our goals in the years coming, years of major importance between the LOI of 2008 and the EDR of 2010.