

Minutes of a phone meeting about the I7 Application for very Forward Calorimetry

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The first goal of the meeting was to discuss the possible improvements of the infrastructure in the laboratories for the continuation of the R&D within FCAL using the FP7 infrastructure call. The second goal was to create a rough scheme how the first goal should be included in a FP7 application.

1 The Physics Goal

LumiCal and BeamCal are designed for excellent shower position reconstruction or shower detection efficiency to match the physics needs for the luminosity measurement or electron tagging. Using Monte-Carlo simulations it was demonstrated that compact cylindrical sampling calorimeters may reach the necessary performance.

The infrastructure to be created within the I7 framework will be used to measure the shower reconstruction performance with a tracking device in front of the calorimeters. The tracker will precisely predict the electron impact point to be compared with the shower position measurement. These measurements will then be confronted with the Monte Carlo estimates to obtain an enhanced understanding of the shower reconstruction performance.

2 Infrastructure Needed

The following infrastructure needs to be developed to tackle the physics goal.

- A flexible cylindrical tungsten absorber structure with absorber layers. The mechanical frame has to fulfill the precision requirements for LumiCal (micrometer level) and the space between adjacent layers must be adjustable to allow to test different sensor layer assemble technologies. The depth of the absorber structure will be 10 radiation length. A standard ECAL prototype will be used as 'tail catcher' for the electromagnetic shower to maintain good energy resolution.

Tel Aviv University will inquire the market in Israel. A preliminary design was done a few years ago together with JINR.

- FE and ADC ASICS to instrument 10 sectors of 30° with sensors. UST Cracow will overtake.
- Assembly of the sensor sectors using tools to be developed. UST Cracow needs partners. DESY is an opportunity, also CERN may be asked. An electronics designer is needed for this task. TA University will check the possibility to send a designer e.g. to DESY.
- Optical position control of the sectors with respect to the tungsten frame and of the tungsten frame with respect to the sensors um micrometer level. INP is interested.
- Data Acquisition will be developed as a 'common tool' in one standard for all detectors. Tel Aviv University is interested to join this activity.
- Power pulsing is of common interest, both for ILC and CLIC. The ASICS developed by UST will foresee this possibility. A facility to deliver the pulsed power will be necessary, but is not considered here. Here we need collaboration with Partners.

Written by W. Lohmann, 27.08.2009.