

## Summary of the Meeting on Beam Energy Measurements at YerPhi in Yerevan (Armenia) from 24.10.2006 to 26.10.2006

Present :

S. Kostromin, N. Morozov (DLNP JINR Dubna)  
R. Makarov (MSU Moscow)  
S. Boogert (Royal Holloway University London)  
B. Maiheu (University College London)  
K. Hiller, H.J. Schreiber, M. Viti (DESY)  
R. Melikian, V. Nikoghossian (Yerevan)

The meeting covered the following topics:

- End Station A (ESA) activities
- Synchrotron radiation for beam energy measurement
- Compton backscattering (CBS) for beam energy measurement
- The ILC BPM based spectrometer: 3-magnet vs. 4-magnet chicane
- A new method for beam energy measurement using light radiated in superposition of laser wave and magnet field

The topic on **End Station A** activities at SLAC started with a talk of N. Morozov on the magnet activities in Dubna and a proposal for the magnetic measurement plans at SLAC. The measurements at the SLAC test bench will start at the end of October. This talk was followed by S. Kostromin on track simulations of electrons through ESA including four magnets and BPMs. It was discussed and emphasized to use the GEANT4 framework for future tracking studies. B. Maiheu gave a status report on the ESA test runs from April and July 2006, including first results. This contribution was followed by a talk from S. Boogert on the BPM development at UCL, including results from existing high-position resolution BPMs at ATF at KEK.

In the discussion followed it was pointed out that for the next test run in February 2007 at SLAC the four magnets should be in operation. UCL is very interested to finalize its new ILC-BPM and will, if possible, install it for data taking in February 2007.

Details of an optimized magnet-BPM arrangement for the next run will be discussed between M. Woods and S. Boogert. In the meantime the decision is to move BPM4 to the mid chicane.

The **synchrotron radiation** topic was started by J. Schreiber by a summary of the paper recently submitted as an LC note. Also, next possible steps were shortly presented. R. Makarov discussed his successful GEANT4 simulation of synchrotron radiation generated within the magnets of a possible ILC BPM based magnetic chicane. Implementation of possible mirrors and

some detector response is planned. R. Makarov also summarized the status of hardware activities for a gas amplification detector in Dubna. It is hoped to test the first prototype with a gamma source in spring 2007.

A status report of the idea of the **Compton backscattering** (CBS) and its possible application for the ILC was presented by M. Viti. After some introduction Michele discussed new aspects: possible multiple interactions between beam particles and laser photons during their overlap and non-linear effects which might disturb the behaviour of the edge electrons. Both effects were found to be negligible. Michele also summarized the study of the sommer student J. Lange on the impact of background synchrotron radiation to the position measurement of the backscattered laser photons. It is suggested to implement an absorber of Pb 20 mm thickness which maintains the original photon direction better than 0.5 micrometer. He also pointed out some next steps needed to refine this study.

A comparison of pros and cons of the **3-magnet vs. 4-magnet chicane** was presented by K. Hiller, accounting for variations of e.g. the B-field precision, the number of BPMs and their position resolution and distances between the magnets. If for the 4-magnet chicane only the first two magnets are required to have high precision, both magnet chicane versions are very similar in many respects.

R. Melikian talked about **a new option of beam energy measurement** when light is radiated off beam particles superimposed with a laser within a solenoid. After some discussions it was pointed out that the prerequisites assumed should be clarified. Also, in order to note a significant signal in an experiment, an experimental physicist should be involved in this study. We expect further information at the next meeting.

The collaboration warmly thanks our host for the great support and the organization of a very interesting and successful meeting.

The next meeting is expected to be held in the second half of May 2007. London is the main host candidate. If for some reasons London is unable to invite the collaboration, DESY Zeuthen will take over the responsibility. Clarification is expected about three month before the next meeting.

The presentations of the meeting and the summary are accessible on the web-page

<http://www-zeuthen.desy.de/main/html/aktuelles/workshops.html>

Yerevan, October 27, 2006

V. Nikoghossian and H.J. Schreiber