

Summary of a Meeting on Beam Energy Measurements at DESY Zeuthen from 21.11. to 23.11.2005

Present :

V. Duginov, R. Makarov, N. Morozov, N. Skatchkov, B. Zalikhanov (DLNP JINR Dubna)

M. Wing (partly) (University College London)

K. Laihem (partly), H.J. Schreiber (DESY Zeuthen)

R. Melikian, V. Nikoghossian (Yerevan)

The meeting started with an overview of M. Wing on the long term plans and general objectives of the British groups involved in beam energy monitoring at the ILC, see his talk for more details.

The meeting summarized the progress of several approaches to measure the beam energy with high precision. In particular, emphasizes were directed to continuation of E_{beam} studies by means of the BPM spectrometer, see the talks of N. Morozov, V. Duginov and H.J. Schreiber (on behalf of A. Liapine). Possible participation of Dubna and DESY Zeuthen on the test bench measurements at SLAC in 2006 were extensively discussed. Both laboratories expressed their basic interest to join these test runs and are highly welcomed by the collaboration. Subjects to be covered should be magnetic field issues and RF BPM work. Details will be further discussed with the institutions involved.

An other topic to be discussed was to monitor the beam energy using synchrotron radiation produced within the magnets of the spectrometer chicane, see the talk of H.J. Schreiber, B. Zalikhanov and R. Makarov. The method seems promising, but needs some common definition of an overall experimental set-up and a dedicated detector. Dubna accounts for detector development, with the aim to produce a small prototype in 2006. Further simulations are very important and are ongoing in Dubna (using GEANT4) as well as in Zeuthen (with GEANT3). Exchange of informations is essential to achieve significant effort up to the next meeting. Possible calibration procedure(s) of this method has (have) also to be evaluated.

R. Melikian presented some new aspects of using resonance absorption of laser light by the beam electrons within a static magnetic field, aimed for precise beam energy measurements. In a second contribution on this subject N. Skatchkov replied on some points inherent in this method. In private discussions consensus was found, resulting to a document in which both sites (as well as DESY Z.) explained their interest to perform a small 'proof of principle' experiment at Yerevan. This proposal was originally made by V. Nikoghossian during the meeting. But before any experimental activities should start more clarifications on mainly theoretical aspects of the method have to be achieved.

H.J. Schreiber gave an introduction on measuring the ILC beam energy using Compton backscattering of laser light. This method seems encouraging, needs however more dedicated

simulations and in particular a design for the detector in order to achieve the precision needed. Interest from the Yerevan site is welcome.

Finally, new approaches on beam energy determinations were proposed. N. Skatchkov indicated the possibility to use the reaction $e^+e^- \rightarrow \mu^+\mu^-$ to obtain information on E_beam, while B. Zalikhanov proposed a method based on beam induced E and B fields in a dedicated detector. Both approaches need however further studies before conclusions on their feasibility can be drawn. More details are expected at the next meeting.

It was agreed to have the next meeting in Dubna in April/May 2006. Details will be provided by V. Duginov relatively soon.

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

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

Zeuthen, December 2005

H.Jürgen Schreiber