

Summary of the Energy Spectrometer Meeting - DESY Zeuthen

March 17-18

Present: Victor Duginov, Nikolai Morozov, Tair Mamedov, Nick Walker (partly),
Karl-Heinz Hiller, Alexej Ljapine, H.Jürgen Schreiber

The following items were intensively discussed at the meeting and agreement has been achieved on possible next steps as listed in the following.

- Position of the energy spectrometer within the BDS
 - it seems appropriate to position the spectrometer within the diagnostic section of the BDS
 - also positioning in the final focus section seems possible (about 150 m upstream of the IP)

The space required should be about 30 to 50 m. The position should also respect that σ_x should be less than 50 μm (σ_y is anywhere of only few μm). Details have however to be specified with the group responsible for the design of the BDS.

- BPMs
 - The concept of a cavity monitor with slot couplings to the waveguide has been developed and should be continued. The prototype I confirmed basic rf-characteristics as expected. For several reasons (see the talk of A. Ljapine) a new prototype (with the dipole frequency at 5.5 GHz) will be designed and tested, also with beam. Results from in-beam tests are expected in about a year.
 - The question of the slope-dependent signal has been largely discussed and solutions to get rid of it have to be found.
 - Requirements on alignment precisions will be evaluated in the next days.
 - Long-term stability of the electronics has to be investigated and a scheme should be prepared for the next meeting.
 - The basic goal of the BPMs is to achieve a position resolution of ~ 100 nm.
- Magnets
 - The question whether to use a warm (iron) or a superconducting magnet for the spectrometer will be pursued. A summary of pros and cons is in preparation and will be distributed within the next days.
 - Dubna will follow the concept of iron magnets. The plan of next activities provided by N. Morozov has been accepted. More details and a concept for the ancillary magnets are expected at the next meeting.

- We believe that the bending angle of 1 mrad, the length of the spectrometer magnet of 3 m and the distance between the ancillary magnet and the spectrometer magnet of about 10 m should be retained for further studies.
 - The basic goal of $\Delta B/B = (1 - 3) \times 10^{-5}$ for the integrated B-field error should be envisaged in order to achieve the required beam energy precision.
 - The alternative of a superconducting magnet will be discussed with Saclay at the next ECFA/DESY LC workshop in Amsterdam.
- Alignment/Stabilization
 - It is agreed to position the components of the spectrometer (BPMs, magnets) on a common rigid girder of a length of about 30 m (or more ?). This would reduce relative position displacements of the spectrometer components due to fast vibrations to a small or negligible level.
 - Long-term ground motion must be accounted for by dedicated global and local alignment systems. It was also suggested to install the upstream (downstream) BPMs on a common stiff girder, with the possibility to rotate it by half the spectrometer bending angle at one side. Each monitor should have its own high-precision mover, so that the overall position resolution (of ~ 100 nm) will be preserved.
 - Schemes for alignment and stabilization will be developed and discussed at the next meeting. Also, temperature stabilization of the spectrometer magnet is an issue and will be covered by the Dubna group.
 - Beam energy measurement by means of synchrotron radiation
 - The idea of the method has been presented (see talk of T. Mamedov) and Dubna is encouraged to follow this proposal.
 - In particular, steps towards to some realistic schemes are highly desirable.
 - Synchrotron radiation is an issue and should be considered for each item.

It was agreed to have the next meeting in Dubna about 2 to 3 weeks before the next ECFA LC workshop.

Victor Duginov
H.Jürgen Schreiber