August 17, 1998
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LEP SPECTROMETER PROJECT

Summary Notes of the 18^{th} meeting held on August 06, 1998

Present: C. Bovet, B. Dehning, W. Kalbreier, J. Matheson, G. Mugnai, S. Myers (chairman), M. Placidi, F. Roncarolo, I. Ruehl, M. Sassowsky, L. Vos

Excused: D. Cornuet, G. De Rijk, N. Hilleret, Y. Muttoni

Comments to Summary Notes of previous meeting - None.

First PU data - B. Dehning showed an interesting correlation between the jumps in the WPS sensors signals during beam dumps (see notes of previous meeting) and the voltage measured across the short wire (slides 1, 2). The leading effect is still being investigated.

B. Dehning then reported on first measurements obtained with the Bergoz electronics installed on the BEST1 and BEST2 modules.
Position calibration data obtained with local closed orbit bumps indicate a sensitivity of $\sim 1.8\,\mu$m/mV in both planes (slide3).
Four button sum signals (slides 4, 5) still show some dependence on bunch current ($\sim 2\,\mu$m equivalent).
Position difference between BEST1 and BEST2 PUs (slide 6) showed a $\sim 27\,\mu$m/hr drift in the H-plane and a $\sim\ 5\mu$m variation/drift in the V-plane. The associated distributions show (slide 7) $0.54\,\mu$m and $0.72\,\mu$m rms values respectively.

SR from MB2 and MBI dipoles - M. Placidi compared synchrotron radiation issues associated with the MB2 dipole used this year and the stronger/shorter MBI to be installed next year.
The study shows that:

-The SR power **emitted** in the MBI is **twice that from MB2**.

-As the beam deflection is the same in the two layouts, the SR fan will hit the same region of the vacuum chamber as now, so the **deposited** SR power will also be (only) twice as large.

-The radiation will start hitting the chamber **downstream** the quadrupoles QL17 and QL18 i.e. **no specific protective action is required**.

-A quantitative evaluation for the (rather extreme) situation $2\ \times\ 5$ mA / 100 GeV beams (Chamonix '98, p.147, D. Brandt) is provided for comparison and/or scaling.

-The critical energy also increases by a factor of two. This does not affect the absorption coefficient λ which around 1 MeV is the same for most of the absorbers and the attenuation $I = I_o \exp(-\rho\, t/\lambda)$ is only function of the density ρ for a given material thickness t.

Temperature coefficient measurements on injection line MBIs - F. Roncarolo showed results from measurements of field intensity and core temperature vs. time in some of the MBI dipoles in the LEP injection lines. The aim is to quantify the temperature coefficient of the future MBI and decide about the need of the dedicated cooling station for it.
Measurements taken at 94.5 GeV give a coefficient $C_t \sim \pm 2 \times 10^{-5}/\,^{\circ}\mathrm{C}$ i.e. about one order

of magnitude smaller than that measured in the past on the concrete dipoles. The problem now is the **change in sign after a certain time**, when the B-field starts decreasing, as the core temperature is found to be always increasing.
It was felt that this can be properly stabilised with a dedicated cooling system and **its purchase was approved** (see next point).

Mapping working group issues - W. Kalbreier reported about issues from two meetings on spectrometer mapping. Main points were:

-Budget situation under control.

-Girder delivery expected by end of August.

-Some delay in the MBI yoke construction, delivery by September 15.

-End field screens in three μ metal layers 310 mm long around vacuum chamber would provide a $\times 10$ attenuation factor.

-A cheaper technical solution for the Temperature Control Unit (TCU) will allow installation in tunnel. Delivery time is 8 weeks after placing order. This will allow using it for some MBI measurements in the ISR tunnel.
The purchase of the TCU was recommended. Cost estimate: about 60 kCHF.

AOB - The next meeting will be called in due time according to the progress.

M. Placidi