June 22, 1998
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LEP SPECTROMETER PROJECT

Summary Notes of the 17^{th} meeting held on June 18, 1998

Present: W. Coosemans, G. De Rijk, M. Hildreth, W. Kalbreier, J. Montes, G. Mugnai, Y. Muttoni, S. Myers (chairman), M. Placidi, M. Sassowsky, G. Vismara, L. Vos

Excused: D. Cornuet, N. Hilleret

Comments to Summary Notes of previous meeting - None.

Status of installation - M. Placidi reported on some actions taken in the tunnel during the three days of access.

- The heat exchanger controlling the water temperature of the PUs cooling system has been installed together with its lead shield. It works correctly.
- The short (external) wire of the WPS system has been removed to try to understand "wild" wire motion observed during the energy ramp and when the beams are dumped (see M. Hildreth presentation).
- The orientation of the Fluxgate head has been checked:
  the X output represents the transverse-horizontal axis
  the Z output represents the vertical axis
  the Y output represents the longitudinal axis.

WPS measurements - M. Hildreth showed a series of measurements taken with the Fluxgate and the WPS. The Fluxgate B_y component jumps in correspondence of the ramp and of the beam dumps of the order of 600 mG. This should also be the amplitude of the local field changes at the WPS electronics.
The inlet water temperature (up to now cooling both the absorbers and the PUs) looks stable to $\pm 0.7\,^{\circ}\mathrm{C}$ during normal filling cycles but drifts away later (ring open?). The behaviour of the temperature sensor on the WPS reference on block#1 is anti-correlated to the water one.
The Y-inner (long) wire position shows fast jumps at both the beginning and the end of fills. A similar, anti-correlated behaviour is clearly visible on the outer wire.
Smaller amplitude "motion" is seen in the X direction.
Details of the Y-jumps at the BOF and the EOF show an "apparent motion" of about $0.4\,\mu$m at 45 GeV and up to $5 \div 7\,\mu$m at 94.5 GeV.

More data will be taken in the next days with the outer wire removed to try to disentangle between magnetic and "beam" effects on the WPS electronics, sensors, electric earth etc.

At the time of writing we know that **the outer WPS sensors do not register any movement after removal of the wire. This excludes that the observed jumps are an electronic effect and seems to confirm that there is a kind of** *real (captors)* **or** *fake (wire)* **motion associated to some phases of machine operation**.

The QD20 effect - G. Vismara reported on tests made to try to understand the offsets observed at the PU.QD20.R2, R4, R6, R8 depending on the position of the H-collimator located at ~ 50 cm on their right and associated only to the **electron** beam. Electrons reach the PUs **before** positrons and after the collimator. No effect is visible with the positron beam on these PUs nor on the equivalent ones at the left side of the even IPs, for which the layout situation is completely symmetric.
Tests made selecting buttons on diagonals ($A - D$ vs $B - C$) show large offsets on the $A - D$ and negligible on the other one. The up-right A button is then more involved than the down-right C one.
The offsets reach a maximum of > 7 mm for a jaw position of about 35 mm from the beam and then tend to decrease.
An electric field of up to 1 kV applied to electrode A didn't change the picture at all.
Efforts to understand the effect are being pursued.

Magnet issues - W. Kalbreier gave a short report on progress with girder status. Mechanical calculations anticipate a 0.15 mm maximum deformation under load (negligible). Tender being opened this week and delivery expected beginning of August.
Magnetic influence on dipole is also negligible. The magnet will anyway measured **on the girder**.

G. De Rijk said that the die modifications are on the way. There will be a punching test by mid July. The yoke is expected to be delivered beginning of September. and ready for first tests by end of September.
There will be a mapping meeting on Tuesday 23.06.

AOB - M. Placidi showed a recent budget study where the forecast for financial involvements done in Dec. '97 is compared with the updated (June '98) expenditure estimate.
The initial tentative figure of 953 kCHF has evolved to about 1400 kCHF. S. Myers stressed that, **even if we can find money to cope with the 50% overspenditure, there won't be any possibility to exceed it and everybody is asked to comply**.

Some additional shielding will be required when the new MBI will be operational as its field, twice that of the actual dipole, will produce 4 times more energy loss per unit orbit length (~ 600 W/m mA at 100 GeV/beam).
N. Hilleret and M. Placidi have been asked to look into the problem.

The possibility was discussed to install "existing" spare electronics of the NB type on at least two PUs while waiting for the Bergoz one to be available, to start looking at the "QD20 effect" in our layout situation. It came out after further inquiry that what we have on the shelves is only enough to equip one diagonal out of the four required. It would take from 2 to 3 weeks to prepare the rest, for the same person presently busy with the QD20 tests on the machine. As the time estimated to start testing the Bergoz electronics is pretty much the same **it was decided to wait for it**.

The next meeting will be called in due time.

M. Placidi