MINUTES OF THE 123rd MEETING OF THE ENERGY CALIBRATION WORKING GROUP

held at CERN on March 14, 1997

K Modulation work progress report (G.Mugnai)

Giuseppe reported that the work to install the backleg winding in all QD quadrupoles of 7 octants of LEP has started last week. He aknowledges the contribution of technicians from Aleph and DELPHI. Some more help is needed and further discussion are in progress with L3 and OPAL to get the few extra man-weeks needed.

No major problem is foreseen in completing the layout of 27 km of cables before the tunnel closure if this manpower is found. (Bravo! and thanks to SL div. for the promptness to make available the resources for this important preparatory work in order to get a chance to see polarization at 55 GeV)

More on cross checks on BOF-EOF fills (G.Wilkinson)

Guy and Mike have understood the source of most of the differences which have been puzzling us the last meeting.

There is now an agreemeent on what to call the value of the energy measured by resonant depolarization. They have now agreed on how to average the number of depolarizations which constitutes one depolarization experiment and agreed on what to call BOF value and EOF value for MD fills with continous resonant depolarizations. In this last case the average over the first and last half hour of measurements is used.

Guy also understood the differences reported the last meeting between the use of the std database and of the smoothened database for the NMR readings: effectively he was applying a cut to energy rises larger than 10 MEV/hour equivalent on the std DB loggings. Once this cut removed the two treatments give the same average behaviour over a fill or in terms of the rise/hour.

Out of all this progress, the agreement now between Guy's analysis and Mike's one is within 0.1 MeV for the 6 BOF-EOF fills (i.e. the average residual is 1 Mev`±0.3 MeV)

Guy is using a truly 2D histogram sampling (from the average NMR readings vs Tday and Tfill) and explored the relevance of binning: he found no significant differences between using 5 or 2 bins along Tday.

He also evaluated the effect on the mass and width from the various models of field rise due to parasitic currents. Typically the width is unaffected while the mass changes by ~2 MeV when applying the histogram model and ≥ 3MeV when using a fitted function a la Renton.

Peter is looking more in detail in the discrepancy.

More on dipole models (M.Koratzinos)

Mike showed that for 1993 any model performs worst than in 1995 (may not too surprisingly given that all of the models have been derived from 1995 NMR data).

The so called 'Tuesday' Model (i.e. modelling of the field rise after the recordings of the parasitic currents on one Tuesday in November 1996 and using a model derived from the ISR observations on the test bench) agrees suprisingly well with the 2D2T model thus reinforcing our belief in the assumption that the average over the run in 1995 represents the average behaviour of any given year for the parasitic currents.

During the discussion we were reminded that there is an open issue about the influence of the Bending modulation: while the average over the NMR data shows an average change of ~ 3 MeV equivalent in energy we measure 1.5 MeV for the only experiment when calibration was done before and after a BM. At the time of Warsaw we assumed 2.5±1 Mev as the effect of BM and that had negligible effects on physics quantities in the end. Will have to repeat the exercise.

Open issues:

•decide whether to use the NMR data directly for 1995: will not change the central values, but will avoid problem of 2D2T model which fails to give an average residual compatible with 0 for the 6 BOF-EOF fills. In this respect Guy will try to see what is the probability to get a shift of 1 Mev by choosing randomly any 6 fills logged in 1995. This would also avoid the additional error associated to the different treatment of bending modulated fills vs non-bending modulated fills.

•Check effect of assumed factorization between T and train effects. We know from the ISR that this is an approximation, but we need to quantify in order to define an error. Enrico+Bernd to look at ISR data in this respect, Mike can also use the 'Tuesday' model as a probe to check effects of factorization and possible corelations with errors on the T coefficients of the temperature model.

•Minor one: we use three different methods for defining the Energy the beginning of a fill:in 1993 the NMR in the ref. Magnet, in 1994 the dipole main current reading and in 1995 the average of the NMR in the tunnel.

Next meeting Mar. 21st.

Scriba:Tiziano Camporesi