Minutes of the 139th Energy Calibration Meeting held on 19 September 1997

1 News

Alain Blondel introduced Nading Qi from ALEPH. Nading will work on data analysis and will maintain the ALEPH LEP monitoring software set up by Paul Bright-Thomas.

Alain stated that the issue of using radiative returns to the Z0 to determine the LEP energy (see last meeting) had been discussed in ALEPH. ALEPH believes it feasible to use this method in the mu-mubar and q-qbar channels. An estimated precision was stated, with the request that this value not be minuted! The estimate was encouraging. Alain explained how an important systematic will be in the uncertainties arising in the ISR. There had been discussions with the author of KORALZ who believed that at present such problems would induce a 30 MeV error. However with work it was hoped that this could be substantially reduced.

Guy Wilkinson and Gerjan Bobbink said that they would raise this subject in DELPHI and L3.

Bernd Dehning gave the plans for next two calibration experiments. Two slots are foreseen in the next fortnight. The calibration team's intention was to devote one slot to trying to depolarise at low energy (41 GeV) and then ramp and depolarise at 50 GeV, and to devote the other slot to studies at 50 GeV. Those present at the meeting expressed the strong wish that the 41 - 50 GeV experiment include an additional calibration at P-2. Bernd was opposed to this because of the additional time required, which might compromise the 50 GeV point. The opinion was also expressed that the 50 GeV slot also include a point at P-2, as isolated high energy calibrations could not be unambiguously used in constraining the extrapolation error. Bernd agreed to consider these requests.

2 Information on the calibration of 6/9/97 – 7/9/97

Florian Sonnemann described what had occurred in the 50 GeV polarisation of 7/9/97 (fill 4121, 60/60 optics). A first measurement was made with a polarisation level of 4%. Afterwards the Qs was adjusted slightly - this small change had the effect of severely reducing the polarisation and preventing further measurements. The good news is that a posteriori this behaviour was well reproduced by simulation and is therefore understood. The morale is that at high energies small changes can have big effects - one must tread carefully!

Despite the low polarisation achieved in this experiment Florian said that in future things should improve. Thanks to the k-modulation all the QD's are now measured and the alignment data are now ready. This information can be used in the next calibration.

Florian also showed the result of his simulation with various models all of which demonstrated higher polarisation levels for 60/60 optics compared with 90/60 .

3 Preliminary look at the 1997 dipole data + calibrations

Guy Wilkinson has had a first look at the dipole data (=NMR readings + magnet temperatures) for the present run. He has made DST's for the following datasets: Z0 running (16 fills), 183 GeV running (75 fills), runs at high energy but not 183 GeV (9 fills) and the depolarisation MDs. The depolarisation fills are 4000, which had a P-2 calibration with 90/60 optics, and fill 4121, which had a P-2 calibration and then a ramp to 50 GeV and further calibration, all with 60/60 optics. To date he has analysed the 183 running and the calibration fills.

The logging quality of these data is very good. In the 183 fills only 2 fills were found without NMR data. All other fills had NMR data in all octants.

HOWEVER, the logging in the calibration fill 4121 is bad. There are no NMR data until AFTER the ramp to 50 GeV. Bernd Dehning said this was caused by a delayed change of LEP mode. Unless these data can be recovered from elsewhere the P-2 point cannot be used to calibrate the NMRs, and the fill has very limited power in the extrapolation error studies.

ACTION: Enrico Bravin to look at his private logging to see if these data are recoverable.

Guy presented some general characteristics of the data. Most interesting is that the dipole rise is relatively small (6-7 MeV per beam over a fill). This is credited to the effect of the bending modulations.

Alain Blondel asked whether bending modulations were routinely made before calibration fills as well as physics fills. Bernd said no. Alain requested that this be done in future.

Guy showed a first attempt to calibrate the NMRs. Using fill 4000 he determined calibration coefficients for each NMR, assuming a simple linear dependence through the origin. He then used these coefficients to determine the model prediction for the energy at the 50 GeV depolarisation in fill 4121. An agreement of better than 0.5 MeV was found. Though encouraging, these results are preliminary.

Finally he showed what is the energy in the 183 GeV running using these calibration coefficients for the NMRs. The initial energy determined in this manner over all fills shows a tight distribution of FWHM 10 MeV beam. However there are several fills with significantly different energy. These outliers will be investigated.

4 Next Meeting

The next meeting will be at 15:00 in the Pavillon on Friday 26 September

Guy Wilkinson 21/9/97