Minutes of the 185th Energy Calibration Meeting held on 22 Oct 1999

1 Status of updated preliminary energy files

Following requests from the experiments, an updated preliminary energy file is being prepared on a timescale suitable for the LEPC. There were reports on the setting of the energy scale for this file, and the RF analysis.

Guy Wilkinson has performed an updated NMR fit to the ensemble of polarisation data, including the recent multipoint 101/45 fill where a 60 GeV point was recorded. This last fill is consistent with the other data, and there is no evidence of an optics dependence bias in the model (although one 101/45 fill is scattered with respect to the others). The shape and magnitude of the residuals from the global fit is remarkably similar to that of 1997 and 1998. When applying the calibration coefficients from the 1999 fit to determine the 1999 energy scale at $\mathrm{E_b} \sim 100\,\mathrm{GeV}$, a value is obtained within $2\,\mathrm{MeV}$ of that found with the 1998 coefficients.

Mike Hildreth has studied the behaviour of the RF model throughout the year. The logging is of good quality (apart from in the past week where no Q_s has been measured). The $\mathrm{E_{cm}}$ corrections at each interaction point are relatively stable with time, and range between 8 MeV (L3) to -16 MeV (DELPHI).

A file has been made of the ~ 550 fills so far recorded in the year. After the meeting this file was analysed by the experiments, and was found to be suitable for the purposes of the LEPC. It was found however that care was needed in properly luminosity weighting the file entries, as the large number of brief RF frequency shifts can cause a significant bias if not properly treated. This correction must be cross-checked with care when the final energies are issued.

2 Error on $\mathrm{E_b}$ from Q_s vs V_{RF}

Anke-Susanne Muller made some accompanying remarks to her presentation of the previous meeting, explaining in detail the error assignment from her Q_s vs V_{RF} analysis. The total error ($\sim 25\,\mathrm{MeV}$) has contributions from a 'statistical' uncertainty in the meaurement of Q_s, knowledge of machine parameters (eg. momentum compaction factor and the inverse bending radius) and dataset dependent model parameters (eg. the voltage calibration and additional energy losses.)

It seemed reasonable that with additional work certain significant error components (eg. Q_s measurement, the energy dependence of the momentum compaction factor, the knowledge of the inverse bending radius...) could be reduced, The measurement remains very interesting.

3 Dispersion measurement

Joerg Wenninger reported on a measurement of the vertical dispersion performed for IP4 in a recent fill at 100 GeV (the automatic RF frequency changes make 101 GeV running a difficult environment for this measurement). A small value of 0.2 ± 0.1 mm was obtained, in agreement with theory and past measurments.

4 Next meeting

The next meeting will be on Thursday 11 November at 14:00 (to be confirmed).

Guy Wilkinson, 1 November 1999.