Minutes of the 169th Energy Calibration Meeting held on 13 November 1998

1 1998 analysis

Guy Wilkinson presented a preliminary analysis of the 18 flux loop experiments in 1998. He requires at least 10 probes to be working at all energy points, and makes a linear fit in the region 40 to 60 GeV, and then looks at the residuals at 94.5 GeV beam energy.

Plots were presented for all working probes, for a common subset of probes, and for each probe individually.

Peter Renton has made a similar analysis, with slightly different quality criteria, and fitting in the same range as for 1997. He finds consistent results.

The residuals range from -5 to -24 MeV for all working probes, and from -15 to -31 MeV taking a common subset of probes, with a slight tendency for values later in the year to be more negative. This is quite consistent with the observations in 1997.

For individual probes, the rms scatter over different flux loop measurements is between 3 and 10 MeV.

2 Cross check of polarisation residuals

Anke Muller showed residuals w.r.t. fits to individual polarisation fills, using the same method as she presented last year, where NMR's are first normalised relative to the flux loops. The fills show the same trends as were presented by Peter Renton in the previous meeting.

3 Evaluation of κ for the energy spread measurement

Joerg Wenninger explained the physics behind the parameter κ that relates the coherent and incoherent Q_{s}. The main contribution to the impedance in LEP is from the copper RF cavities.

Joerg has examined data from the streak camera in 1998, looking at the bunch length as a function of bunch current. Different fills show different behaviour, implying values of κ between zero and 0.04. No reason for the changes in behaviour has been identified. However, these observations are consistent with the value from the Z scaled by beam energy used by Eric Lancon for the energy spread measurement (i.e. $\kappa \approx 0.02 \pm 0.02$ for high energy running).

4 Discussion of energy spread

The uncertainties in the beam energy spread coming from the statistical uncertainty in the bunch length measurement at ALEPH, the uncertainty in κ and the uncertainty in the momentum compaction coefficient α were reviewed. These will be included in the next draft of the 1997 energy paper. All the related tables can be found on the web with the minutes.

5 Next meeting

The next meeting will be announced later.

Pippa Wells, 17 November 1998