Minutes of the 172nd Energy Calibration Meeting held on 5 February 1999

1 Energy file for 1998 data

Guy Wilkinson announced that a technical energy file has been released for all the Z and high energy fills in 1998. Initial cross-checks have revealed that a small number of short fills are missing. Also, there are a few fills with no logged NMR data. The energy scale for these has been fixed from neighbouring fills by hand. However, it will be verified whether private logging of NMR data exists for these fills.

The first two high energy fills both have fill number 4550, which those implementing the files should beware of.

The files have a new format, with extra columns for the beam energy spread and rf frequency shift, with typical shifts of 100 Hz to give the default value of 4270 that was used for 1998 running.

The initial dipole energy per fill has been cleaned up by shifting the start time by 5 minutes for those fills with an unexpectedly large jump in the first few minutes.

The typical dipole rise in a fill is only about 2 MeV after four hours. For the few long fills that took place, the rise increases to around 5 MeV after 7 hours.

The x_{arc} data show similar seasonal variations to previous years.

The central values have been calculated from a simultaneous fit to all the polarisation fills taken during the year. A larger scatter is observed than in 1997, with the three earlier fills from June and July having more positive residuals of $E_{\mathrm{pol}} - E_{\mathrm{NMR}}$ than the fills from September and later. Examining the residuals w.r.t. polarisation data probe by probe, it is evident that most are stable, but NMR 4 shows a jump of about 40 MeV between the two groups. This is not seen in the scatter of initial B field per fill at physics energy. Although NMR 4 does see a slightly wider distribution of initial energies, this is only by 30 percent - far smaller then the relative energy shift implied by the change in residuals.

The (DELPHI) luminosity weighted centre-of-mass energy for the high energy running is 188.626 MeV, with an average beam energy spread of 166 MeV. (This corresponds to the calculated beam energy spread, taking into account RF frequency shifts). The average centre-of-mass energies for the two Z running periods differ by about 80 MeV, which is understood to be due to the change in magnet calibration that took place just after the high energy running began.

2 Discussion of errors for 1998 data

It was agreed to meet in two weeks time to fix a preliminary error for the 1998 data. Guy Wilkinson will check the scatter of predicted physics energies over NMR probes, and the effect of using different subsets of polarisation fills, and perhaps the effect of leaving out the badly behaved NMR 4.

Mike Hildreth commented that the RF uncertainty will be the same as last year.

The horizontal orbit corrections were stable once a golden orbit was established and are thought to have been somewhat smaller than in 1997, so this uncertainty will be reduced.

The largest error will again come from the flux-loop/NMR comparison. People are invited to reconsider the plot of deviations at physics energy between flux-loop and NMR after fitting in the polarisation region, and to propose a suitable value for the uncertainty.

3 Other business

Bernd Dehning reported that money has been approved to replace the NMR probes twice if necessary during the 1999 run.

Ernst Peschardt reported that the RF reference frequency will be derived from a GPS system in 1999, since the rubidium crystal was proving unreliable.

4 Next meeting

The next meeting will be on Friday 19 February at 14:00 in the Pavillon, to fix the preliminary error for the 1998 data.

Pippa Wells, 5 February 1999.