# Minutes of the 146th Energy Calibration Meeting held on 9 January 1998

## 1 Averaging NMR measurements

Nading Qi showed his work in progress using the measurements from the 16 NMR's recorded between August and October last year for runs at 183 GeV. The analysis only uses NMR values for times with good ALEPH luminosity. The ALEPH luminosity was also used to make a weighted average NMR value. The average magnetic field is calculated for each of the 16 NMR's. The averages are the same to within 7 parts per 1000.

The next step will be to evaluate a calibration coefficient for each NMR using the polarisation data, and to investigate the range of values of NMR readings. A ring averaged energy will also be found from the NMR data. Different averaging schemes were discussed in the meeting (equal weight to each probe compared to equal weight for each octant).

The various plots presented show:

- NMR measurement vs time in days for some individual probes. The plots on the left are before the luminosity quality cut, and therefore include some incorrect low values.
- The distribution of NMR measurements for individual probes. For one probe this is shown over a wider range of magnetic field to indicate the effect of the luminosity requirement. For most probes a reduced range is shown, with and without lumi weighting.

## 2 Status of RF analysis

Mike Hildreth presented a new technique for identifying RF phase errors using beam orbit information. Defining

$$R_{bom} = (x_{e+} - x_{e-})_R - (x_{e+} - x_{e-})_L$$

i.e. the difference of differences between the positron and electron orbits on the right and left of each IP, this can be related to the energy gain across the IP, assuming that the electrons and positrons have the same gain. The energy gain measured from $R_{bom}$ can be compared with that expected from the RF volts and stable phase angle. Any discrepency indicates a phase error. The average phase errors observed using this method are $-2, +6, -16$ and $+2$ degrees respectively at IP 2,4,6,8. The resulting correction/uncertainty should not be much bigger than the order of 10 MeV and is being calculated.

## 3 Requests for MD time in 1998

The energy calibration requests for MD/physics time will be presented at the Chamonix workshop.

From the low rms of Enmr vs. Epol in 1997, the meeting concluded that it is not useful to make a polarisation calibration every two weeks, but rather to focus on four or five long MD measurements.

- Cross calibration of 60/60 and physics (102/90 or 90/90??) optics.
- Big effort to increase the lever arm to 60 GeV.
- Two or more fills with multiple energy points to improve the statistics.
- Some more time for NMR/flux-loop studies.
- One long fill at lower energy with frequent polarisation measurements to verify the measurement of the rise term with 16 NMR's

In addition there is the problem of whether to commission the 60/60 optics with solenoids on for polarisation. Discussions in the meeting and by e-mail have pointed out that this is not essential, because for the higher energies the solenoids should anyway be off. However, ALEPH and DELPHI representatives in particular should ask for feedback on the experiment's attitude to switching off/on the solenoid. If some of the MD's can be achieved with solenoids on the scheduling is more flexible and the risk of damage reduced. This will be considered again next week.

## 4 Next Meeting

The next meeting will be on Friday 16 January 1998 at 14:00 in the Pavillon. On the agenda so far:

- Comparing NMR/flux-loop and NMR/polarisation local slopes (Joerg Wenninger)
- Updates from Guy Wilkinson and Peter Renton
- Discussion of requests for 1998
- Discussion of how best to normalise the data using the combined Epol/Enmr/Efl information.

Pippa Wells, 9 January 1997