Minutes of the 188th Energy Calibration Meeting held on 28 Jan 2000

1 Outstanding tasks with the 1999 data

Guy Wilkinson stated the need to produce preliminary 1999 energy files, and a proper error estimate, for the spring conferences. Although the Q_s analysis has now evolved to a very promising state, and the spectrometer results are encouraging, it was agreed to use only the NMR-extrapolation method for these preliminary results, assuming that this yields an error adequate for the physics needs. An eventual final energy determination will indeed take advantage of the other analyses. This determination will be made with the benefit of the data we hope to accumulate this year.

It is intended that the energy file will be released sometime early in the week of 14 Feb, and the error assignments finalised soon after.

Guy reminded the meeting of the outstanding tasks concerning the 1999 spectrometer data, and the importance of completing these before the 2000 data are upon us. Anke-Susanne Muller agreed to report on recent progress in the Q_s analysis in a future meeting.

2 1999 flux loop analyses

Pete Renton presented the status of his 1999 flux loop analysis. A plot of the flux loop–NMR residuals at physics energy against time looks very similar to what was seen in 1998. A quantitative analysis yields a mean offset of -5.9 ± 8.4 MeV (cf. -10.0 ± 7.1 MeV in 1998), and an average scatter per probe of 14.4 MeV (cf 8.7 MeV in 1998). It is possible that this average scatter has been inflated by the fact that in 1999 each probe was replaced 3 or 4 times throughout the year. Another important consideration is that the number of flux loop octants in 1999 giving meaningful data varied was never 8, and sometimes as low as 1! (mean number 4.6) This can also contribute to the probe scatter, and more worryingly, opens the question of how representative of the ring as a whole the device can claim to be. Pete will ivestigate further.

3 Central frequency and correctors

Joerg Wenninger presented the results of his studies on central frequency, horizonal correctors, and the relationship between the two. This work will soon be explained in detail in an SL note.

Naive expectation suggests that there should be a correlation between corrector settings and central frequency, meaning that applying the corrections for each effect independently in the energy model is incorrect. However, measurements have shown no such correlation, so the corrections have indeed been applied separately, with an additional systematic error assigned.

Joerg has revisited this question, on paper and in MAD, examining particularly the role of the sextupoles. He has shown that the sextupoles introduce a term which prevents the horizontal corrector settings from systematically shifting the central frequency. This insight will result in the removal of an error source from the energy model (~ 2 MeV), and has enabled the central frequency data to be re-evaluated for all years. The new data are shifted with respect to the old data by $1-2$ Hz, and the evolution is seen to be much smoother.

4 Next meeting

In order to complete the 1999 preliminary analysis, both the 11 and 18 Feb are reserved for afternoon meetings. These will be confirmed.

Guy Wilkinson, 28 January 1999.