Minutes of the 223rd Energy Calibration Meeting held on 1 July 2003

Present: Bernd Dehning, Daniel Kramer, Pete Renton, Eric Torrence (by phone), Anke-Susanne Muller (by phone/part time), Jorg Wenninger, Guy Wilkinson

Apologies: Pippa Wells

1 News since last meeting

Comments have been received on draft 2 of the paper. Replies had been sent out on all but the flux loop section, which Pete will attend to.

2 Flux Loop Analysis

Pete make a proposal for the final FL error assignment, which was accepted by the meeting:

- Any possible non-linearity in the FL is constrained in a similar manner to that described in draft 2. A fit is made to the low energy FL-NMR residuals in the 40-50 GeV interval, and compared to the residuals at 55-60 GeV. The same is done for the NMR-RDP residuals. The difference in result, extrapolated up to 100 GeV, gives 15 MeV at 100 GeV. (The numbers discussed in meeting 222 were buggy and should be discarded.)
- Contributions from field outside the FL: there is an estimated 10^{-4} error coming from non-linearities in the fringe field. This gives 5 MeV in going from 50 GeV to 100 GeV.

Both errors should be taken to scale with energy and taken as fully correlated throughout the 72-108 GeV region where measurements were made.

Pete also showed recent work on looking for an energy dependence in the FL offset. He has remade figure 7 from draft 2, now with uncertainties coming from the statistical error on the mean. Fitting this, first with a single parameter and then with two parameters (see attached plots), suggest strongly that indeed a *small* slope is present. A little more work is needed to evaluate the choice of the errors on each point, choice of binning, and range of fit.

3 Energy Measurement Combination

Guy presented a proposal for the combination of the FL, Q_s and spectrometer measurements. He has built up a 2 parameter fit which uses the full covariance matrices of the measurements. Pete has cross-checked the results for certain benchmark scenarios. The fit can also account for possible year to year variations in the model, although this has little practical consequence (apart from '96 – to be pursued).

The results of example fits can be seen in the transparencies. The meeting agreed this was the best approach for treating the data. One new problem illustrated by this exercise is that all measurements are very compatible indeed, such that the χ^2 / p.d.f. is very low.

4 Other Error Contributions

Guy presented a list of the other error sources which must be considered along with the extrapolation uncertainty, together with suggested assignments, where possible. Some useful discussion resulted, with some follow up work for Jorg and Guy.

The outstanding error still to be fixed is that associated with the BFS, in 2000.

5 BPM electronics bench tests

Daniel showed a plot (attached) for one BPM card which shows good stability over a period of several hours. He agreed to make similar studies for all the cards, and to see if these results are equally true for 4 and 8 bunch operation.

6 Next Draft and Next Meeting

A new draft will be prepared with a complete set of numbers for each analysis, the combination and the model error assignment. This will be made available some time in August, at which time the next meeting will be announced.

Guy Wilkinson, 2 July 2003.