Minutes of the 158th Energy Calibration Meeting held on 1 July 1998

1 News

Paris Sphicas informed us that a problem with the setting of the RF frequency developed yesterday evening. As a result, since 19:00 on Tuesday 30 June, the real RF frequency is 22 Hz LOWER than the set and measured RF frequency. The apparent frequency is typically 4292 Hz in physics, while in reality it is still the 100Hz offset from nominal of 4270 Hz. Once the hardware problem is fixed we will discuss the best way to patch the false data.

2 RF model error

Mike Hildreth showed results from John Jowett, who has run simulations of imperfect LEP machines and checked the effect of the RF (SL-Note 97-84). For good machines, there is a scatter of centre-of-mass energies at the interaction points of 5 MeV. The resulting error in the beam energy of 3 MeV should therefore be combined in quadrature with an additional uncertainty of 2.5 MeV, bringing the total to 4 MeV.

3 Central frequency problem

Joerg Wenninger reported that in a recent central frequency measurement, two good measurements within half an hour differed by 5 Hz. This is not understood, but might lead to an increase in the uncertainty from this source. This is however unlikely to change the total error for the 1997 data. Joerg hopes to make progress on this in the next week.

4 Error table for Vancouver

The present errors for 1997 high energy data are shown in table 1.

5 Paper for Vancouver

There was a discussion of a rough paper draft for submission to Vancouver. Various people volunteered to provide final figures. Mike Hildreth is rewriting the RF section. Help from Joerg Wenninger will be needed for the xarc/central-frequency/orbit-corrector section.

Source	Error [MeV]
Extrapolation from NMR–polarisation	
NMR rms/sqrt(N) at physics energy	10
Different $E_{\rm pol}$ fills	5
Flux-loop test of extrapolation	
NMR flux-loop difference at physics energy	20
Field not measured by flux loop	5
Polarisation systematic	1
e^+e^- energy difference	2
Optics difference	4
Corrector effects	3
Tide	1
Initial dipole energy	2
Dipole rise modelling	1
IP specific corrections ($\sigma(E_{\rm CM})/2$)	
RF model	4
Dispersion	2
Total	25

Table 1: Summary of contributions to the beam energy uncertainty for high energy running in 1997.

6 Next meeting

The next meeting will be on Friday 10 July at 15:00 in the Pavillon.

Pippa Wells, 1 July 1998