Minutes of the 203rd Energy Calibration Meeting held on 3 December 2000

1 E_b from ISR two fermion events

Pete Renton presented a summary of work performed within the experiments to determine the beam energy from two fermion events undergoing radiative return to the Z^0. Assuming single photon emission, and knowing the mass of the Z from LEP 1, the collision energy can in principle be computed.

Preliminary (and some published) analyses have been carried out by all of the experiments in the $q\bar{q}$ channel, and by some experiments in the $\mu^+\mu^-$ (and indeed $\tau^+\tau^-$) final states. Assigned systematics come from ISR related uncertainties ($\Delta E_b \sim 20\,\mathrm{MeV}$), fragmentation/detector effects ($\Delta E_b \sim 40 - 60\,\mathrm{MeV}$ for $q\bar{q}$) and knowledge of the absolute polar angle scale ($\Delta E_b\, 5 - 50\,\mathrm{MeV}$ depending on the experiment). The analyses are at too preliminary a stage to perform a meaningful LEP wide average, but a by-eye mean gives a significant discrepancy with E_b from the NMR model of at least 100 MeV (low).

A meeting has been organised for next week to establish a coherent work plan between the experiments with a view to investigating the systematics more carefully, and obtaining a reliable LEP averaged result. The final precision on this result might approach 30 MeV.

2 Central frequency in 2000

Joerg Wenninger reported on the analysis of the central frequencies in 2000. The large number of fills means that there are a correspondingly large number of orbits to be analysed. The analysis has followed that of previous years, attempting to rely on good quality data where possible. A complication is the need to correct for the BFS. The results are available and ready to be included in the energy file production. The evolution of the central frequency with time is similar to that of previous years; a significant excursion can be correlated with the autumn flooding in Martigny.

3 RF studies update

Joerg also gave an update to his RF studies (see minutes and transparencies of previous meeting for an introduction). The BOM analysis of the sawtooth has an uncertainty coming from the absolute calibration of the BOM system &/or dispersion scale. This can be constrained by looking at dispersion measurements. 21 such measurements have been studied throughout the year and scale factors obtained octant by octant, amounting on average to a 3% correction, with an uncertainty of 1-2% (a factor of two better than had been guessed at the time of the previous meeting).

Using inputs prepared by Guy Wilkinson, Joerg has calculated RF sawtooth corrections at the spectrometer for the measurements of this year. These are being fed back into the spectrometer energy analysis. Joerg will now fit his model against those MDs where the RF was manipulated in order to improve the central values and obtain errors.

Finally Joerg reminded the meeting of the significant contribution the wigglers make to the energy loss, being typically 10% of the total effect at 60 GeV.

4 Next meeting

14:00 Friday, 8 December 2000, to be confirmed.

Guy Wilkinson, 6 December 2000