Minutes of the 183rd Energy Calibration Meeting held on 24 Sep 1999

1 Spectrometer analysis of recent multipoint fills

Recently there have been two 4 point fills spanning 41 to 55 GeV (6302 and 6371). A preliminary study has been made of 6371 from the point of view of the spectrometer.

Eric Torrence has used the displacement and rotation data to fit the relative gains of the outer BPMs in each arm at 41, 44 and 50 GeV (unfortunately the 55 GeV data for the spectrometer are corrupted for this fill due to a timing problem). He obtains reasonably stable results with respect to energy for the RHS, but for the LHS there is a variation of 5×10^{-3}. Averaging out, for the time being, this energy/time/whatever dependence, the change in bend angle with f_{RF} variation can be calculated. At 40 and 44 GeV a value close to expectation is obtained, but at 50 GeV a value twice larger is found. Finally, the change in bend angle across the 3 points can be used to determine the relative energy ratio as determined by the spectrometer for 44/40 and 50/40 and compared to the E_{pol} ratios. (Here it is also necessary to input the calculated field integrals, which were supplied by Juan Palacios, and the RF corrections to go to the mean beam energy, which were supplied by Mike Hildreth.) The 44/40 ratio differs by 1×10^{-4}, and the 50/40 ratio by 5×10^{-4} from the E_{pol} values. Progress is being made, but clearly more work is needed.

Jan Prochnow has also analysed the data from this fill. He obtains fits to the relative gains which are consistent with Eric's. He also draws attention to wire data from this fill indicating an apparent movement with time of $3\,\mu$m for the RHS arm. This is not correlated with any significant temperature variation. If genuine this may have implications for the calculation performed by Eric. Jan also remarks on some structure in the BPM AGC (automatic gain control) signal, which occurs during the beam rotations. This may possibly indicate something not optimised in the BPM electronics, or it may be a genuine effect coming from the larger net signal induced on the BPM buttons as the beam goes off centre.

In concluding the discussion Bernd Dehning presented a list of possible actions to be performed on the BPM electronics during the remainder of the run and during the shutdown with the aim of performing the performance.

2 Other matters

Due to SPS problems and a point 4 cryogenic intervention a significant amount of time will be available in the coming week for depolarisation measurements. The meeting discussed how best to use this opportunity. (News one week later: indeed the time has been well spent, with another 60/60 4 point fill, and two 2 point 101/45 fills.)

It was also decided to replace some of the tunnel NMRs, which are now not locking at low energy due to radiation damage. Guy Wilkinson agreed to provide Bernd Dehning with a list of unreliable probes. It will also be necessary to replace one of the type 1 probes in the spectrometer itself, for the same reason.

3 Next meeting

The next meeting will be on Friday 8 October at 14:30.

Guy Wilkinson, 30 September 1999.