Minutes of the 192nd Energy Calibration Meeting held on 15 May 2000

The meeting reviewed the data from the first MD of the year, 7129 (11/5/2000), which successfully depolarised 41, 45 and 50, plus measured the spectrometer bend angle at these energies + 70 and 94 GeV.

1 WPS stability

Esther Barbero showed an analysis of the wire data monitoring the stability of the BPMs throughout the fill. There are movements seen, which are not the same in all stations. However the amplitude of the movements are small ($< 1\mu$m). Some spikes at the start of the fill will be investigated further.

2 NMR behaviour

Guy Wilkinson has looked at the data from both the tunnel NMRs and the spectrometer NMRs.

Of the tunnel NMRs all returned data apart from those in octant 5 (dead due to a CPU problem - now fixed), and octant 8, which was not present at 41 and 45 GeV. Applying the calibration coefficients derived in 1999 and comparing model with Epol gives residuals which are on average small. However the probe in octant 4 has a residual which is $30 - 40$ MeV, suggesting it is in a slightly different position in the magnet compared with last year. These coefficients have been used to calculate NMR model energies at the times of the spectrometer bend angle measurements.

The performance of the spectrometer NMRs are good. Both type 1 NMRs give data at low fields, and the type 2 NMRs give data at high fields, as intended. The data has been used to calculate field integrals, using the model developed by Juan Palacios, at the times of the spectrometer bend angle measurements.

It was noted that the temperature of the spectrometer coil is no longer being logged. This is apparently due to a broken (+ inaccessible probe). However the temperature (which enters as a 2nd order correction in Juan's model) can be recovered from emperical relations derived with the '99 data involving the cooling water temperature. During the fill the temperature rose with energy in a manner which suggests the regulation was not working. Bernd Dehning confirmed that due to an oversight the regulation was not enabled on this occasion.

3 BPM performance

Eric Torrence presented an analysis of the BPM data from this fill. He has upgraded his analysis program so that the gains and bend angle are simultaneously fitted and real errors are returned. The general quality of the data are very good, with the beam successfully repositioned in the same position at each energy point. Two less good features should be noted:

- At 93 GeV less dynamic range is available for the bumps and thus they have a magnitude of about half that at the other points. It is desirable to have a common amplitude at all points.
- When rotations are performed small but noticable shifts are seen in the middle BPM – not as intended.

The gains returned at each point are very stable, apart from a difference at the high energy point. It is likely that this is an artefact of trying to simultaneously fit gains and an angle, coupled with the features mentioned above.

(NB for the transparencies – the 70 GeV point has not yet been analysed as only the angle was measured, with no gain calibration performed.)

News since meeting

All the ingredients of the spectrometer analysis have been put together by Eric, including energy loss corrections calculated by Mike Hildreth, and a comparison has been made to the NMR and depolarisation model. At the time of writing clear discrepancies are seen. These are being investigated.

4 Update to BPM simulator studies

Bernd Dehning presented an update to the studies of BPM stability with a simulator. He showed plots of the BPM response for scans if RF frequency (negligible effect) and beam intensity. The latter was analysed for a centred beam and an offset beam. From these plots a clear plateau is seen, and the attenuators will be tuned so the BPMs sit in this plateau.

5 Next meeting

The next meeting will be announced after the next polarisation MD.

Guy Wilkinson, 22 May 2000.