Minutes of the 214th Energy Calibration Meeting held on 2 November 2001

Present: Joerg Wenninger, Pippa Wells, Bernd Dehning, Federico Roncarolo, Giuseppe Mugnai, Eric Torrence (by phone), Guy Wilkinson

1 Status of the mapping analysis

Bernd showed results concerning the earth field measured in the lab where the magnet remapping is taking place. He presented plots of the three field components with these values superimposed on the measurements made in the tunnel last year. The vertical field component is similar on the right hand side of the magnet, but a little higher on the left hand side. This he attributes to a remnant field from the dipole, which is presumably not an issue for the mapping with the powered magnet. A significant difference is seen in the longitutinal field component, which is attributable to the different orientation of the magnet in the laboratory, with respect to the tunnel.

The mapping apparatus is presently lying dormant. The meeting discussed whether more measurements are required before Christmas. Of worry are the results presented by Federico in meeting 213 which show a 10^{-4} shift in residual after a rearrangement of the apparatus. The mapping team believe this is due to the fact that the Hall probes were aligned by eye, with relatively poor precision, for these later maps. It was agreed that, though a plausible explanation, it would be best if the system could be properly realigned and a few additional maps taken to see if the old value of the residual was recovered. Discussion then focussed on how well the Hall probe–NMR separation is known. Federico had explored a suggestion voiced in the previous meeting that this can be determined by matching structure in the core field sampled by both devices. He found that this had insufficient precision. Bernd argued that a constraint on how this separation has changed between the ISR campaign and the tunnel comes from the in situ 'mole' measurements. Because the mole had only two devices (NMR and a coil), in constrast to the three of the mapping arm (NMR and two hall probes), it was not sensitive to this uncertainty. It was recalled that the two sets of measurements agreed very well.

Bernd and Federico promised to report at the next meeting on the status of the horizontal field component measurement.

Federico also agreed to study a paper, brought to his attention at the Genoble magnet workshop, concerning systematic effects dependent on Hall probe sizes and field gradients. He will assess its relevance, if any, for the MBI mapping.

2 Spectrometer response to RF frequency ladders

Eric presented his analysis of RF frequency ladders. Provided the momentum compaction factor is known, these can be used to determine the absolute gain of the BPMs. He has looked at 5 such ladders, all involving positrons.

The results shown by Eric in the meeting itself showed a significant and puzzling dependence of θ_y on the RF frequency – this is worrying as there should be none! Eric realised however that the analysis had been performed without allowing for the cross-talk terms between x and y in the BPM calibration. He has since redone the studies and found that including these terms results in almost perfect stability in y. It is the updated results which are appended to these minutes.

The analysis in x give results on the absolute gain which are stable and consistent, within 15%, with the expected value. The dependence of the bend angle with f_{RF} is linear and the triplets are well behaved.

Eric will repeat the analysis in fills involving electrons.

3 Sawtooth analysis

Joerg reported that efforts had resumed to understand the long-standing, but small, discrepancy between his sawtooth calculations and those of Mike Hildreth.

4 Any other business

Eric said that the experiments needed to be told soon if they were to expect updated energy files for all the years, or instead whether any potential change would merely be a year independent offset. Guy acknowledged this request and promised a decision before Christmas.

5 Next meeting

The next meeting will be in the late afternoon of Thursday, November 15. The exact time and location will be announced in due course.

Guy Wilkinson, 5 November 2001.