

3/28/05 TeV BPM Upgrade Meeting Minutes

Rob K., Luciano P., Margaret V., Vince P., Marv O., Mike M., Eliana G-W., and Bob W. in attendance.

Rob reported that the random injection TBT outlier and phase problem did not manifest itself at all for any of the last 3 stores! Luciano believes that things he changed in the software explain the cure. SUCCESS!!?

Rob observed a different problem from all the BPMs in B3 -- "At all bpms in the B3 house, the beam appears at turn number 6236 ( or index 6235, counting from 0 ). See, for example, page 17 (doc #1757). In the shots from the previous few days, the beam appeared at turn 10 ( index 9). In the A3, C3, D3, E3 and B0 houses the beam appeared at turn 10 on this shot and on all shots from the previous few days. The data from D0 has always appeared at turn 14 when looked at." Rob's observations are in beams-doc-1757 along with the data from March 27. Luciano will investigate time stamps of this data to look for a clue as to what happened.

Rob presented data suggesting that the fine timing for TBT measurements may be incorrect at C37 and in the D0 house. Marv said that he had observed and he believed corrected a C37 timing problem, but had done so after the last shot. Data from next shot should be checked to see if this illness is cured. Marv will check channel timings for D0 house.

Mike reported that all BPMs passed his diagnostic tests for the weekend shots and although he had not looked in detail there was no evidence that the profiles were not fine. No one had looked at the INJECT frames.

Mike said that the new BPM houses, in spite of the known problems that are being tracked down, are behaving better than the old systems in terms of reliability and store-to-store data consistency.

Mike reported that close analysis of TBT position data shows a sensitivity of reported position to "phase" of the digitizer clock. Fitting TBT position of 50 injected turns to sinusoid yields residuals of magnitude ~20 microns with a 5 turn periodicity (actual size of oscillations in his data is ~200 microns). This effect is not really unexpected due to the locked 5/7 relation between RF frequency and digitizer frequency. The effect is consistent with that described by Brian Chase in his mail message to some of us last week. It is good that Mike has quantified this effect in real beam data and that it is as small as the 20 micron level.

The B0 and D0 BPM are known to have indeterminate offsets. Reported positions for some of these BPMs is now 5 mm different from positions reported by old system. However Mike claims there is no basis at present to know which is correct. He remembers the old system having had arbitrary and large offsets added to the measured positions at some point in the past. There is nothing he wants done in this regard at this time.

Marv plans to install two houses in parallel (A2 and B2) at the next

opportunity.

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