ATF Shift Plans

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- The shift plan remains mostly untouched from the one I presented at the last ATF meeting, I just have a few tweaks/questions.

FONT Shift Plan Nov/Dec 2017

Perform kicker scans at different integration windows (1 Shift)

Nominal Optics

- Calibrate BPMs.
- Perform kicker scans at range of different integration windows.
- Troubleshoot any problems with the firmware and/or DAQ.
- Test adding constant kick to stabilise at a specified location.
- Test channel offset to remove noise floor in firmware.

- Is it better to calibrate each BPM separately, so that we could centre the waist on the BPM we are calibrating?

FONT Shift Plan Nov/Dec 2017

Single BPM IP feedback (1 Shift) – stabilise at IPB
Nominal Optics – with waist at IPB (QD0FF 137.4 A)

- Calibrate (X and Y) and perform jitter scan to measure correlation as function of sample number.
  (Try to improve correlation, may require moving slightly off waist.)
- Single loop FB –Integration windows from 1 sample to 15 samples.
  - (Recalculation of calibration constant and adjust removal of noise floor at each integration window.)
- +/- 20% range gain scan in steps of 5%, with single sample and at integration window of 5 samples, 10 samples and 15 samples (four gain scans).

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Two BPM IP feedback (1 Shift) – stabilise at IPB

High Beta Optics

- Calibrate (X and Y) perform jitter scan to measure correlation as function of sample number.
- Waist scan to put waist on IPB.
- Dual loop FB – Integration windows from 1 sample to 15 samples.
  - (Recalculation of calibration constant and adjust removal of noise floor at each integration window.)
- +/- 10% range gain scan with single sample and at integration window with minimum jitter.
  - (Only two gain scans as more difficult in dual loop as finding minimum in 2D. I think it will take approximately an hour per gain scan.)
- Resolution measurements (for free) to determine resolution limit to feedback performance.

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Two options for final shift:

Option 1

Random Jitter Scan (1 Shift) – stabilise at IPB

Nominal Optics

- Perform single loop and/or dual loop FB.
- Scans at various sample integration windows, new kicker scan required at each new integration window.

Option 2

Charge Scan (1 Shift) – stabilise at IPB

Nominal Optics

- If we believe the sample number dependent effects are charge dependent would it be useful to do a charge scan to show that integration has a better effect at higher/lower charges.

Appendix

FONT Shift Plans Nov/Dec

- In June, we tested a new iteration of feedback firmware that allows for integration over multiple samples in our BPM waveforms.
- We now intend to carry out a systematic study to characterise the performance of this new mode of feedback compared with our previous single-sample only feedback.
- We will require high beta optics for one of our shifts; depending on whether this is possible during the November beam run we would come for either November or December.

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Goal: Investigate 'feedback performance vs. number of samples integrated', identify the optimum integration range and study how this range varies across data sets.

1 shift – Calibrate the IP kicker for use with different integration windows
Nominal Optics

1 shift – Perform 1-BPM feedback with a range of integration windows
Nominal Optics

1.5 shift – Perform 2-BPM IP feedback with a range of integration windows
High Beta Optics

1 shift – Upstream jitter source study with 1-BPM feedback with various integration windows
Nominal Optics