SPS High Bandwidth Transverse Feedback System MD

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1. We are boosting the signal level out of both DACs by 2 dB, thus we are removing 2 dB of attenuation from both the feedback and excitation DAC chains.
 - (a) Claudio want to try to get more drive out of the power amplifiers so that we don't saturate the DSP filter of the feedback system.
 - (b) With a 200 MHz burst signal, no modulation, the excitation signal, measured through the back end chain is 80 mV_p, before removal of the 2 dB attenuation.
 - (c) After removal of 2 dB attenuation, the signal becomes 102 mV_p
2. Timing the back end of the system
 - (a) Monitor the kicker load, excite with 200 MHz, no modulation signal (Jan-22-932), bunch delay 4088, programmable delay 4.10 ns, 131029_205416, beam looks well synchronized with excitation signal.
 - (b) Match feedback and excitation back end signals, observe summed signal. Signal maximized for Fiducial delay 4081, programmable delay 3.55 ns, 407.5 mV_{pp}.
 - (c) Observe pickups to check beam motion, excite with 200 MHz, AM chirp (Jan-22-1018). See Table 1.

Table 1: Data files acquired during beam observation of pickups on Jan. 29, 2013.

Tek File (130129_)	Notes
210129	No signal in spectrogram
210451	No signal in spectrogram, beam too well centered?
210926	Move orbit slightly, still not signal in spectrogram, tune was 0.22 for the above data, should be near nominal 0.18 after 210926.
212114	Still no signal in spectrogram
212501	Observe delta before it is split by resistive splitter, can see motion mode 0 and 1
212756	Dominant mode 1 motion
212915	Dominant mode 1 motion, signals look fine.

3. Time up front end of feedback system. Observe signal on scope and using snap shot. Measurements by both methods agree.
 - (a) ADC Fiducial delay 26
 - (b) Programmable delay 5.7 ns

4. Check the tune by monitoring the pickups. See Table 2

Table 2: Data files acquired during beam observation of pickups on Jan. 29, 2013.

Tek File (130130_)	Notes
000039	No excitation applied. No signal in spectrogram again.
000426	No signal, now measured with unsplit delta signal.
000656	No signal.
001022	Apply mode 1 excitation. tune at 0.18, strange line at 0.172.
001428	Check kicker load signal, looks fine.
003014	Pickup signals, no excitation, bunch intensity has been increased, 6 dB of attenuation added to input of equalizer to accommodate the 600 mV _p signal., no signal in spectrogram.
003243	Excitation on. No signal, can just barely see the chirp.
003641	No signal, can just barely see the chirp, chromaticity seems too high.
005138	New excitation file created, Jan-30-048, no signal observed.
005615	No signal
005828	No signal
010121	No signal
010530	Looking at raw, unsplit delta, can see signal
011007	

5. Backend timing no longer synchronized with bunch on the excitation system, monitor kicker load, 015520, programmable delay 4.1 ns.
6. Feedback system remains synchronized!
- (a) 021244, 3.55 ns
- (b) 021552, 3.50 ns, seems better, only 50 ps off from before.
- (c) 021743, 3.45 ns
7. Forget about the excitation system, attempt to acquire data for high intensity beam. See Table 3.

Table 3: Data files acquired during feedback measurements on Jan. 29, 2013.

Tek File (130130_)	Notes
024957	feedback OFF, excitation OFF
025109	
025200	
025251	
0253 40	
025430	
025519	
025610	

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Tek File (130130_)	Notes
025700	
025750	
025840	
025931	
030937	
031027	
031117	
031258	
034820	
034931	feedback ON
035050	
035206	
035343	feedback OFF
035511	
035616	feedback ON
035756	
0359 10	
040001	
040050	
040143	
040257	
040347	feedback OFF
040502	
040553	