CBETA
BPMs / BAMs for multiple energies

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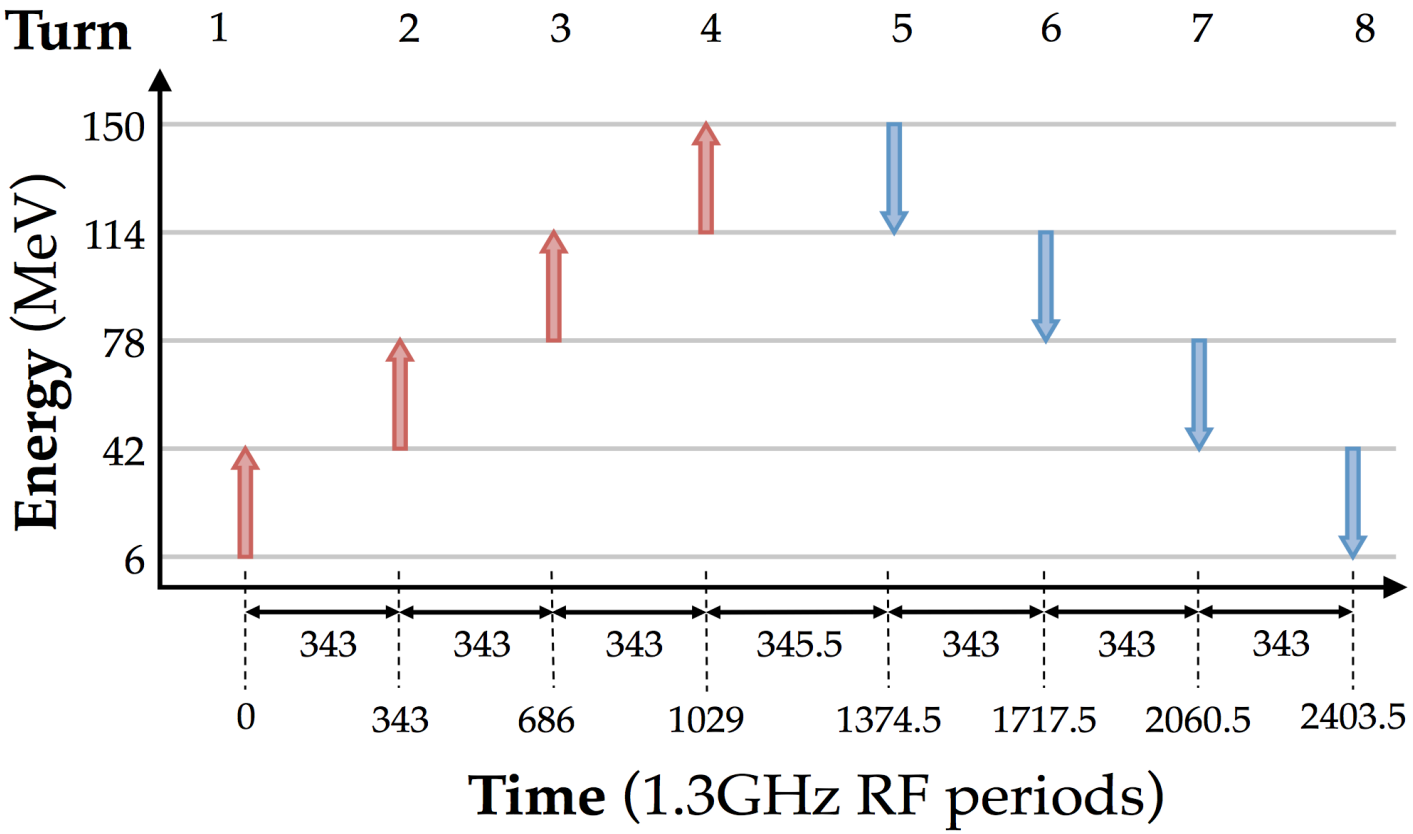
Turn delays for BPM timing



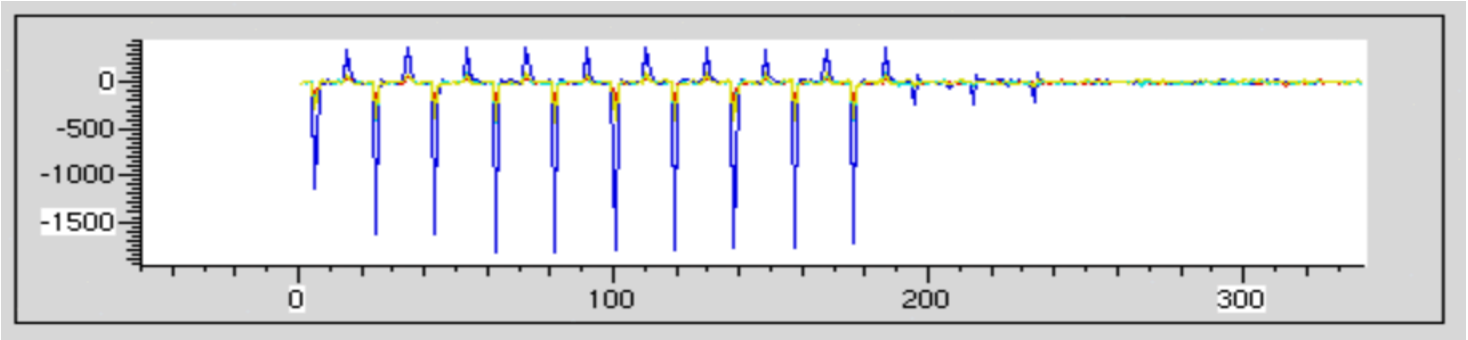
Number of RF periods between turns for a single bunch making 8 passes through the MLC, traversing through all of the acceleration and deceleration energies. Note that the number of periods between turns 4 and 5 is 2.5 more than the others. This is where the beam passes through splitter 4, which has a longer path length.

Turn delays for BPM timing

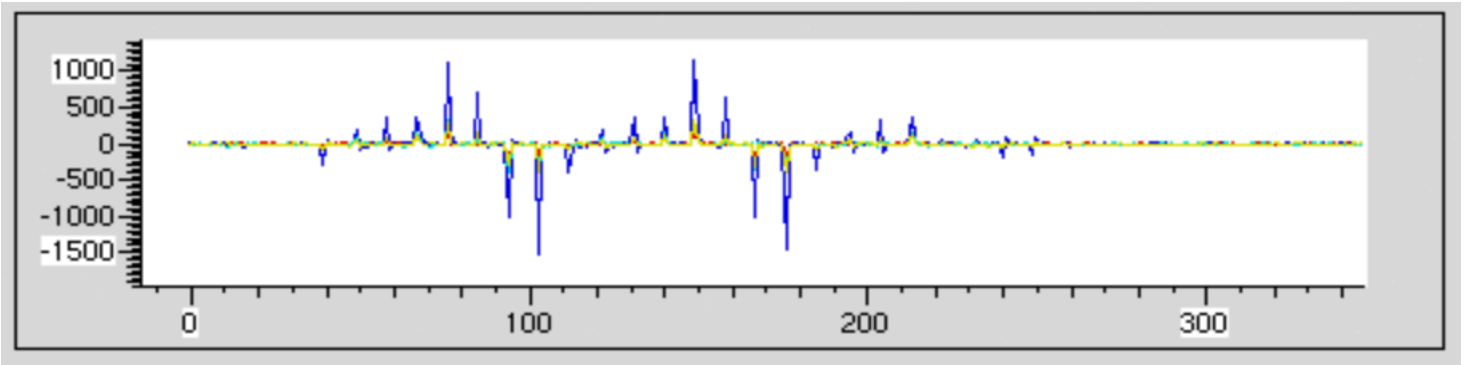
Turn	Energy (MeV) a=accelerating d=decelerating	Delay from first turn (number of 1300 MHz RF periods, 0.76923 ns/period)	Delay from first turn (number of 398.387 MHz ADC periods, 2.51012 ns/period)
1	42 (a)	0	0
2	78 (a)	343	105.1129
3	114 (a)	686	210.2258
4	150 (a)	1029	315.3387
5	114 (d)	1372+2.5=1374.5	421.2177
6	78 (d)	1715+2.5=1717.5	526.3306
7	42 (d)	2058+2.5=2060.5	631.4435
8 (BPMs between MLC and dump line only)	6 (d)	2401+2.5=2403.5	736.5565

Table 2. BPM timing delays referenced from the first energy pass.

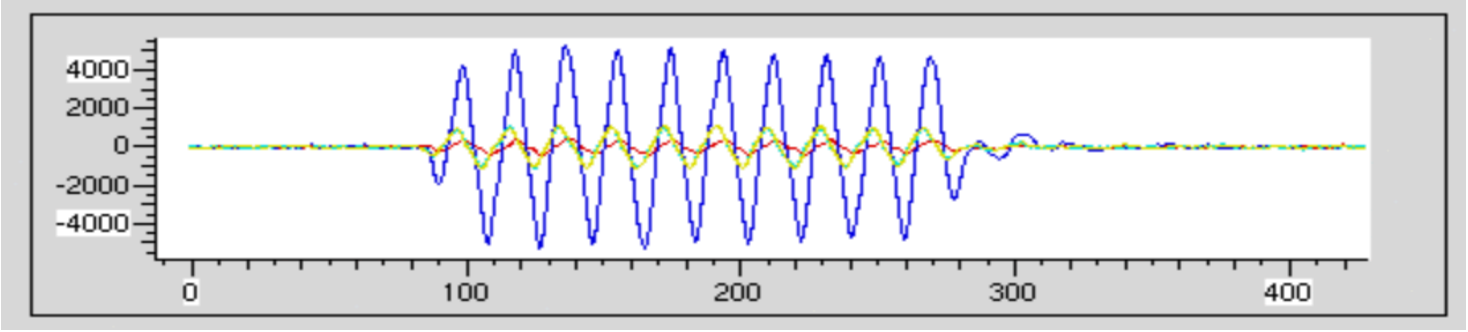
BPM Raw Data Signals



IFABPM02
ADC clock locked to RF and sync'd to bunch rate. Every other bunch is timed to peak.

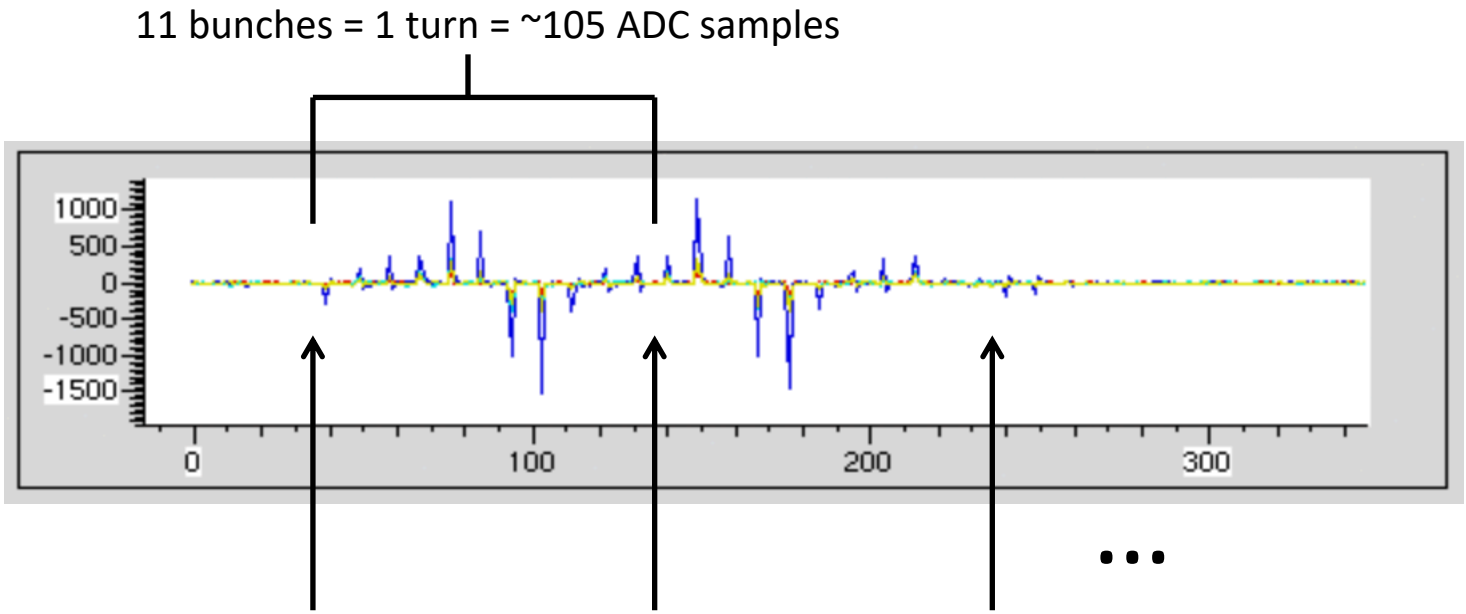


IFABPM03
ADC clock locked to RF but freq not sync'd to bunch rate.



IFABPM01 - BAM
ADC clock locked to RF.

BPM timing for different energy turns



Trigger delay timing will be changed to set the start ADC sample for the selected energy, and the number of ADC samples used for each energy is ~100 or one full turn.