

Ramp Validation

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RHIC Retreat, Jun 30, 2010

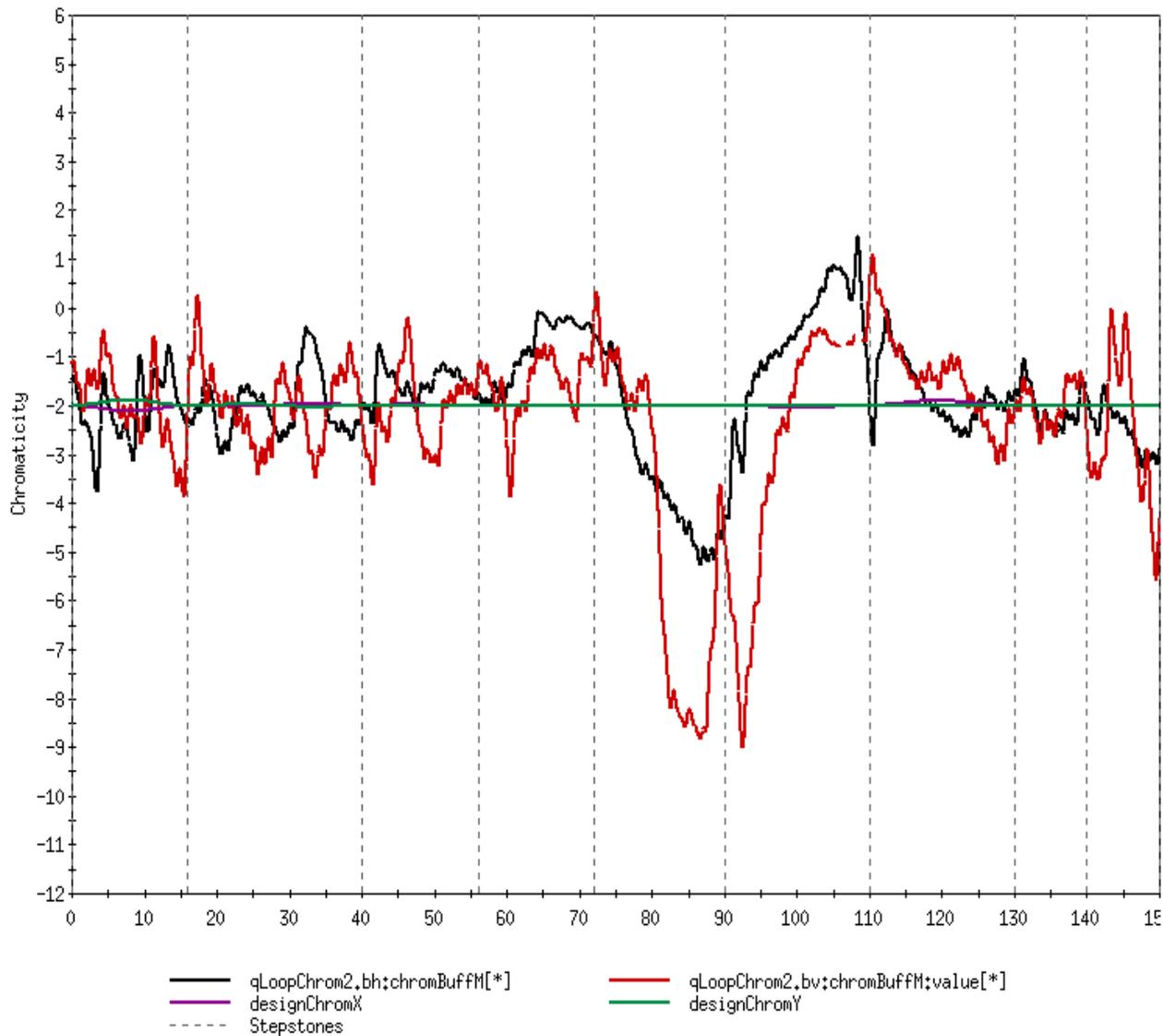
Steps toward using ramps with beam:

- if the ramp is sufficiently different from the one currently in use give Don Bruno enough time to test it with magnets and tune quench detectors
- designed ramp has desired features, but not settings to achieve those features; use RampDesigner to inspect design + trim tunes, chromaticity, skew-quad settings, dipole corrector settings, octopole settings, etc. and design orbit with respect to what feedbacks can fix or beam can survive (designed ramp is “Frankenstein”)
- inform feedbacks about design values
- keep in mind: until tune is fed forward the ramp is not done, and design may need to be adjusted after feed-forward (because some settings might end up outside the ranges of power supplies or very close to the limits).

Fill: 12106 Ring: Blue Current Ramp State: Zero Program Mode: Chromaticity

Stepstone	
1	injection
2	snapback
3	t40
4	t56
5	flattop
6	t90
7	t110
8	beta
9	cogged
10	store

- Show Plots
- Tune
 - Coupling
 - Chromaticity
 - Orbit
 - Diagnostic



	ChromX	ChromY
1	7.4	1.0
2	7.8	0.7
3	8.6	0.1
4	4.5	1.1
5	-1.7	-2.9
6	3.0	-0.1
7	-3.7	-1.3
8	-5.5	-5.8
9	-5.3	-6.1
10	-2.8	-4.3

Feed Forward

Activate

NO DATA available for XrmsT
 NO DATA available for YrmsT
 Loading Diagnostic Data... (Jun 30 00:09:59)
 Using model server OptiCalc (Jun 30 00:10:04)

OptiCalc Design+Trim Ramp: Au104 Config: dbconfig/1252133645 Blue Species: Au Yellow Species: Au

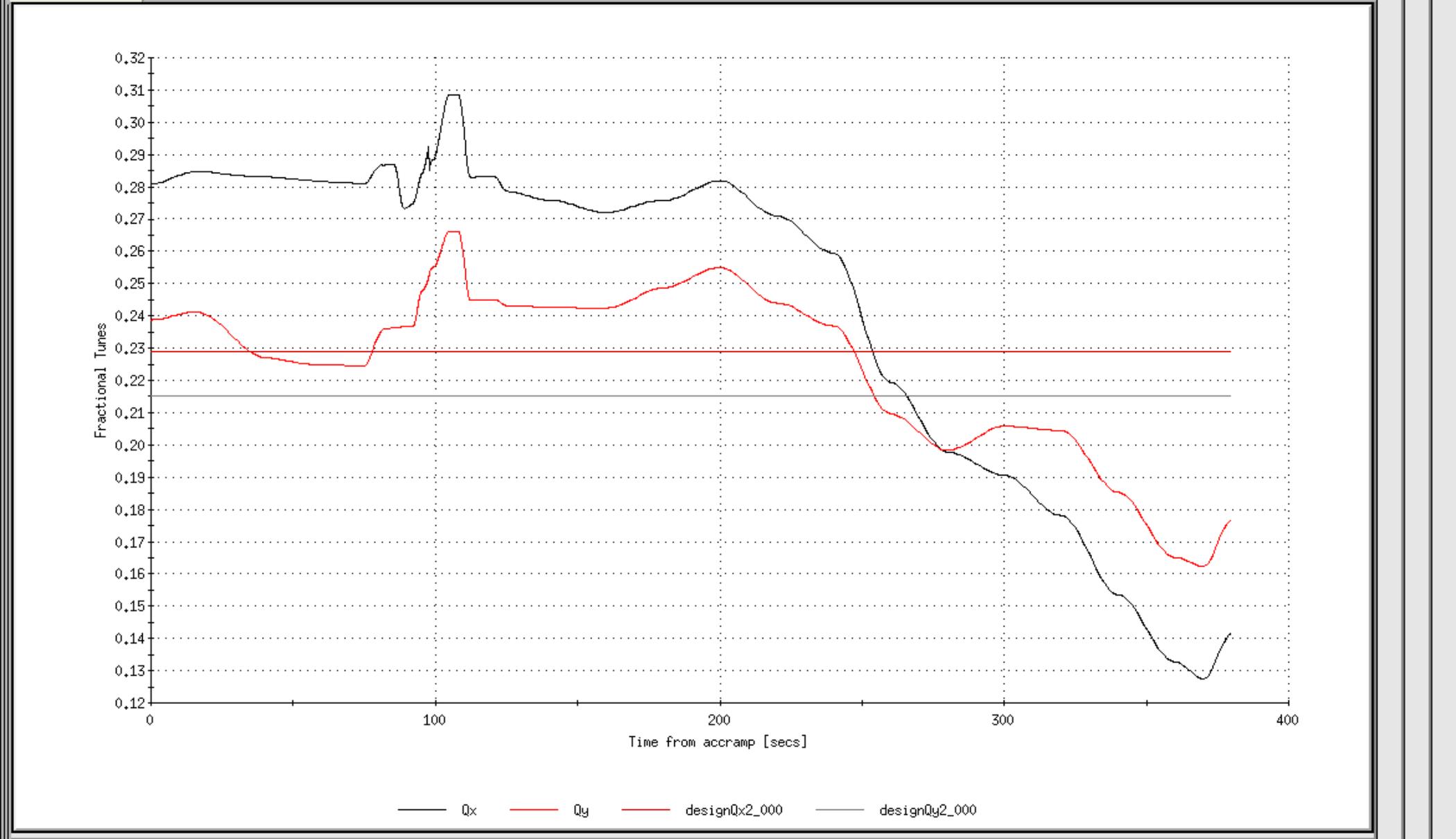
Options	BetaStarSlopes	DR8toDRG	DipoleHarmonics	FamilyTF	WarmTF	polyField	specificTF
State	On	On	Off	On	On	On	On

Blue Yellow DxAngles StoneEditor

DipoleRamp BetaStar TuneChrom Lattice Optics Magnets Power Supplies

Re-read Data Show Stones

Tunes Chromaticity Beta Function Gamma Brho RF Frequency



Insuring correct magnet/cavity settings is only one part of ramp development, other parts include insuring that all other settings are correct and things happen at right time. Due to short allocated time, doing unusual things, frequent need to deal with unexpected, APEX magnifies the problems with the system.

This is the list of encountered issues with tape during APEX and the proposed solutions:

- tape sequences are regularly skipped, but when too much skipping is needed that is the problem: it is hard to tell which sequences must not be skipped and which can be (the proposed solution is to move more sequences into the managers), also many sequences are made of parts and those parts can be missed (the solution to that problem could be better naming of sequences: for example Part 1 of 3, etc.)
- values specific to current ramp should not be hardwired into tape (for example Brho loop start time, radial modulation frequency and amplitude), the solution is to move those values into ADOs,

- either generic ones like specman, or other more appropriate ones
- tape is used to switch modes of certain devices: in that case running different ramp demands changing of many sequences (for example BBQ tune window settings), the proposed solution is to treat those like mode switching in injectors, or move that functionality into managers associated with those devices

Related activity to developing ramps is running previously used ramps, in other words restoring RHIC.

Restoring RHIC could be summarized with:

- **“You can never go back”**, but
- **“You get what you need”**.

In the strictest sense, RHIC is not reproducible during the same day, the ramp which is good in the morning, can be lost in the evening (due to orbit change, to avoid that we have the procedure when to perform automatic orbit correction and when not to). If we treat running old ramps to a greater or lesser extent as ramp development, any previously used ramp can be used again.

Conclusions:

1. check your ramps
2. complexity limits what can be done, to do more we need to simplify what we do