



Workshop on Next-Generation Fast Orbit Feedback Systems for Storage Rings

May 9, 2013
Argonne National Laboratory

Workshop Goals

- The goals of the workshop are both practical and educational
 - Inform hardware experts of the algorithms that will be needed
 - Teach the physicists what new capabilities may be possible with modern hardware
 - Identify promising areas for development
- I'm a bit more interested in what went wrong vs. what went right.



Agenda

- 8:30 Welcome - Glenn Decker (APS, Argonne National Laboratory)
- 8:45 Design, Commissioning, and Operational Experience with the SPEAR-3 Orbit Feedback System
Till Straumann (SSRL)
- 9:45 Open Forum
Open to workshop participants; (soft) 3 viewgraph limit
- 10:15 Break
- 10:30 NSLS-II Feedback System Design, Implementation, and Algorithms
Yuke Tian (Brookhaven National Laboratory)
- 11:30 Overview of Operational Fast Orbit Feedback Systems around the World
Om Singh (Brookhaven National Laboratory)
- 12:00 Lunch
- 1:00 Design Process for the Advanced Photon Source Fast Orbit Feedback System Upgrade
Glenn Decker (APS, Argonne National Laboratory)
- 2:00 Enumeration of questions to be addressed by a feedback simulator to inform feedback system design
Guided Discussion
- 2:30 Open Discussion
- 3:30 Global Orbit Feedback Using Correctors of Different Bandwidths
John Carwardine (APS, Argonne National Laboratory)
- 4:30 Open Discussion
- 5:00 Adjourn



Web Links

Agenda at

<http://usersmeeting2013.conference.anl.gov/Workshops/Wk12.php>

Presentations, discussion topic viewgraphs, and reference material available at

<http://www.aps.anl.gov/asd/diagnostics/FeedbackWorkshop2013.html>



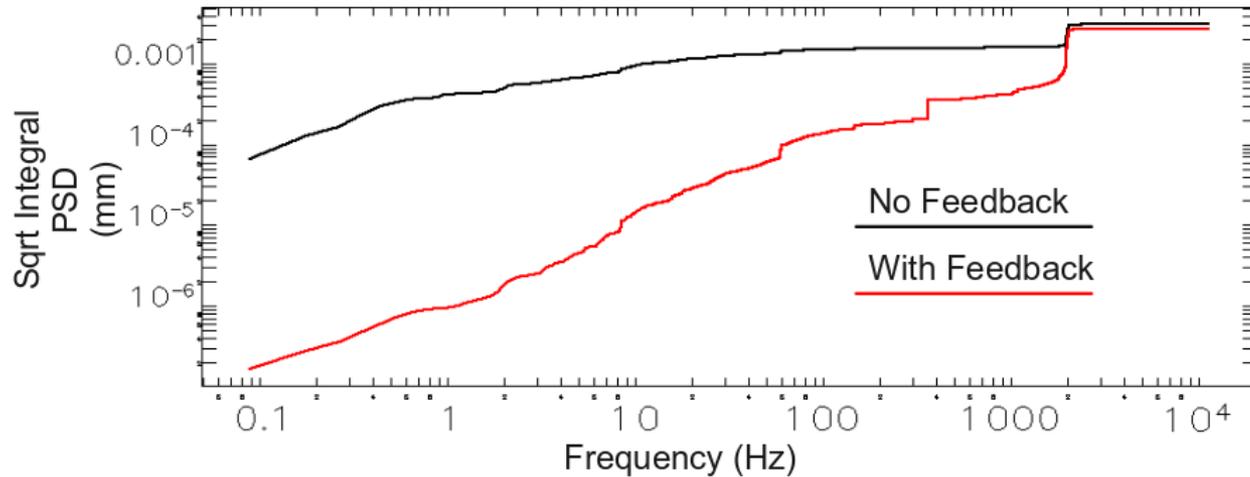
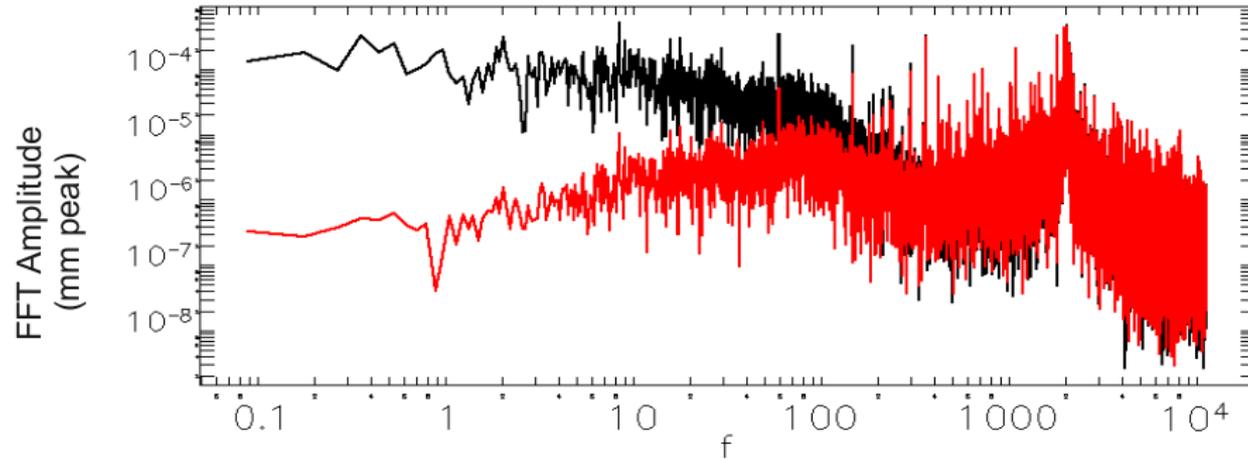
Mythology

- There is no practical way to make slow actuators fast, other than slowing down the fast actuators, which defeats the purpose. Infinite drive voltage would help.
- Concurrently-running band-separated spatially-overlapping orbit feedback systems will have a deadband.
- All fast steering correctors / actuators are identical... or at least the degree to which they're not shouldn't hurt too badly. I hope.
- Feedback with more beam position monitors is always better.
- The response matrix is independent of time.
- Many independently-running local feedback systems is a bad idea.
- Correction of residual path length variations requires that rf frequency be treated as an actuator.

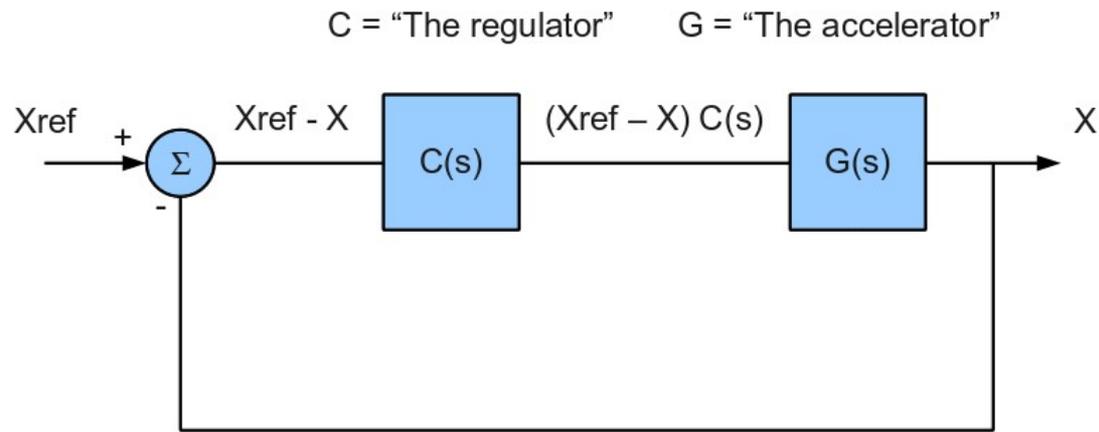


Simulation as Prophecy

Horizontal Beam Motion Spectra - Present and Future



Thank You All for Coming



$$(X_{ref} - X) C(S) G(s) = X$$

$$\frac{X}{X_{ref}} = \frac{C G}{1 + C G}$$

