



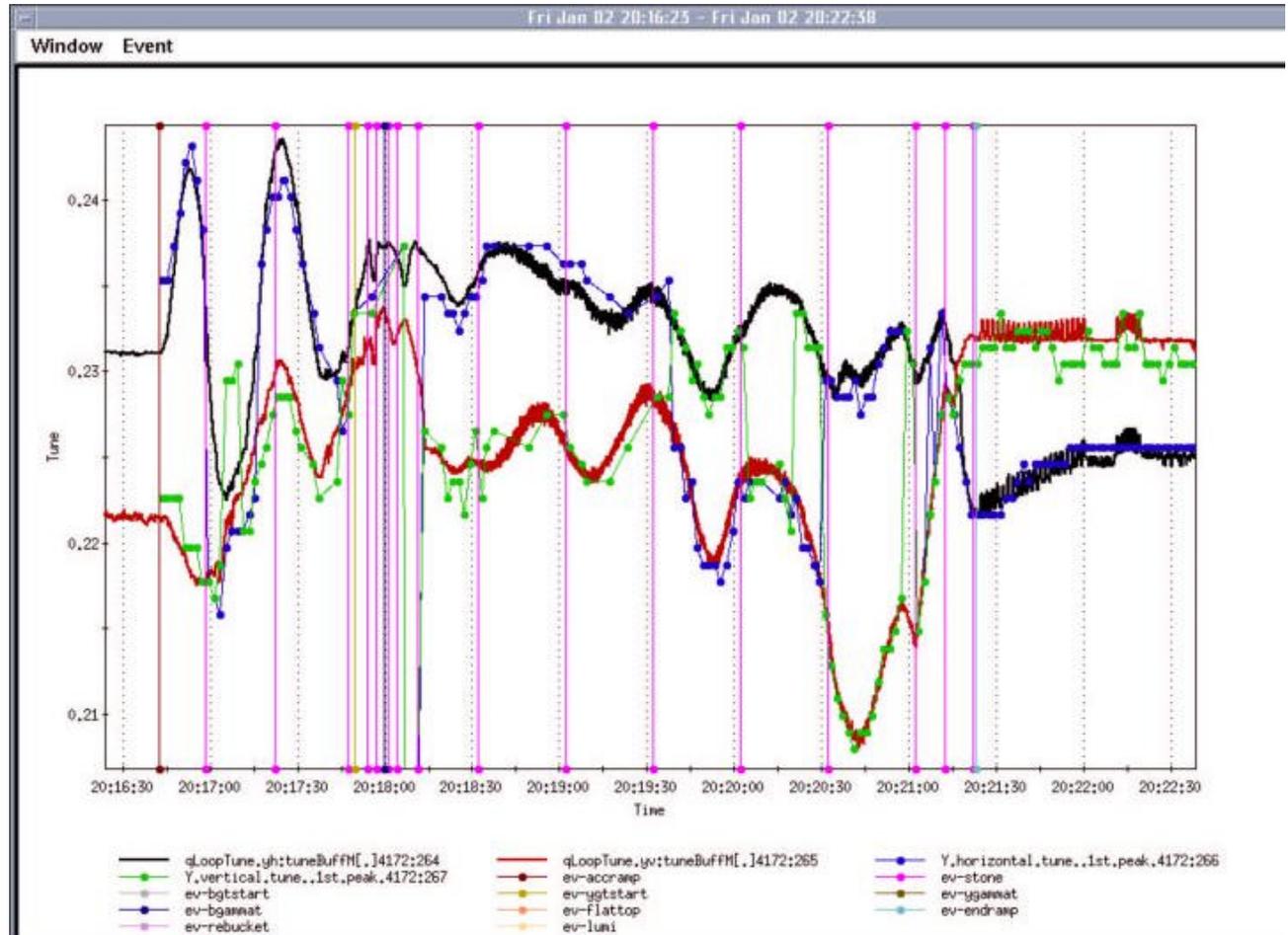
LHC Tune Track/Feedback Review

***Ralph J. Pasquinelli
April 6, 2005***



LHC Tune Track/Feedback

245 MHz
System
In
RHIC



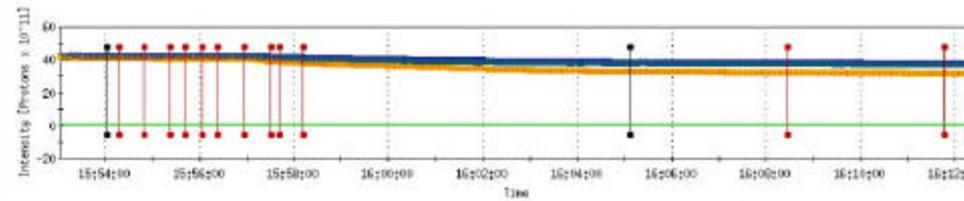
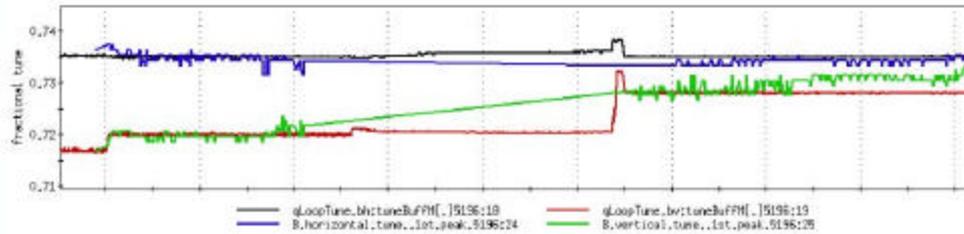
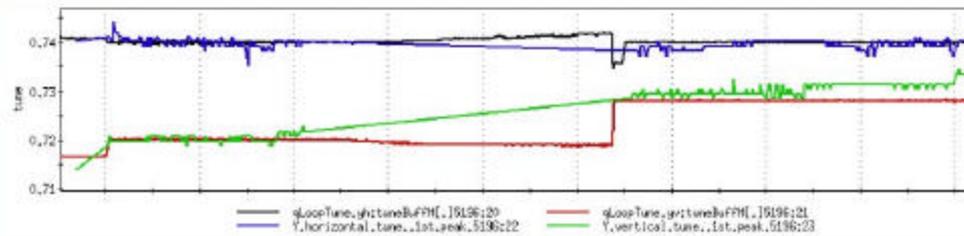
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LHC Tune Track/Feedback

Tune feedback – from Mei’s talk



Ramp
5196



LHC Tune Track/Feedback

Conclusions

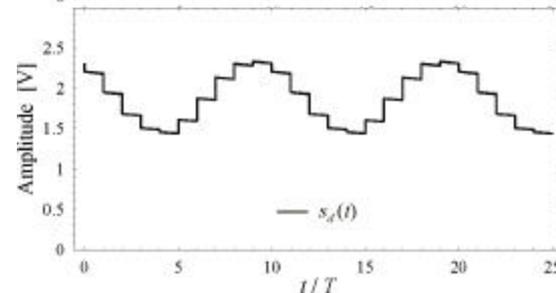
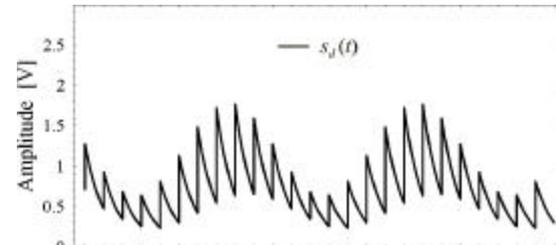
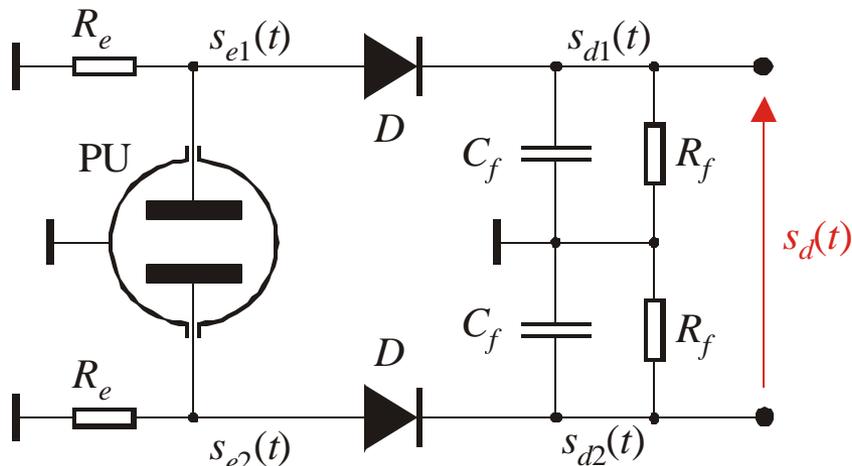
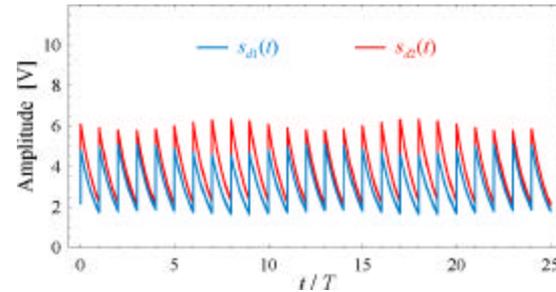
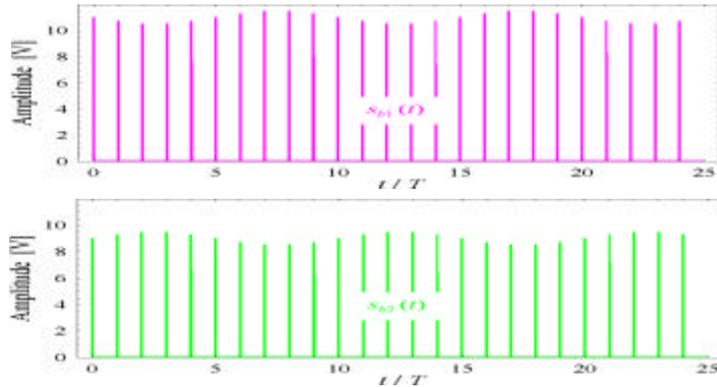
- 245MHz system is mature, a workhorse, runs day in and day out with minimal attention, very useful both for operations and beam experiments, but **transition (or coherent spectrum for LHC) and coupling remain serious weaknesses**
- Robust performance is difficult in the presence of **coupling**
 - *difficult even to measure coupling for feed forward*
 - *coupling feedback needs consideration*

April 6, 2009 **We need BMX on chrom and coupling feedback**



LHC Tune Track/Feedback

Direct Diode Detection – the Principle



$t = 100 T$

April 6, 2005

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LHC Tune Track/Feedback

Diode Detection

High common mode suppression

No need for pickup motion

High dynamic range

Hardware to be supplied by CERN June 06



LHC Tune Track/Feedback

Charge to Review Committee

Resources and Plans

Current Design & Requirements

Ability to Handle Dynamic Range

Schedule

Controls interface

Commissioning

Action Items



LHC Tune Track/Feedback

Resources and Plans

*Collaboration has established good rapport
Plan needs further development and personnel
resources*

CERN provides most hardware

Significant effort at BNL

Contingency Planning

Travel for Collaboration

Current Design & Requirements

Relies heavily on RHIC measurements

Diode detection technique is a break through

*Coupling measurements and 60 Hz needs further
work*



LHC Tune Track/Feedback

Ability to Handle Dynamic Range

Agreement on system requirements

Testing of low intensity bunches at RHIC ?

Modeling of nested feedback loops

Schedule

RHIC has reduced interest in tune feedback

Limited operations at RHIC is a concern

Prototypes at RHIC 11/05 and SPS 6/06



LHC Tune Track/Feedback

Controls interface

CERN has strict standards

Migration from RHIC to CERN standards

Labor intensive

Remote access capability

Commissioning

LHC commissioning schedule is aggressive at 3 months

PLL tune system not required first day

Requires dedicated beam time

Additional personnel resources need to be identified



LHC Tune Track/Feedback

Action Items

Petition for measurements in RHIC

Contingency planning

Push for complete feedback system at RHIC

Continued work on coupling and 60/50Hz noise