

Accelerator: Run II, NuMI, BNB, Test Beams, Seaquest

R. Dixon



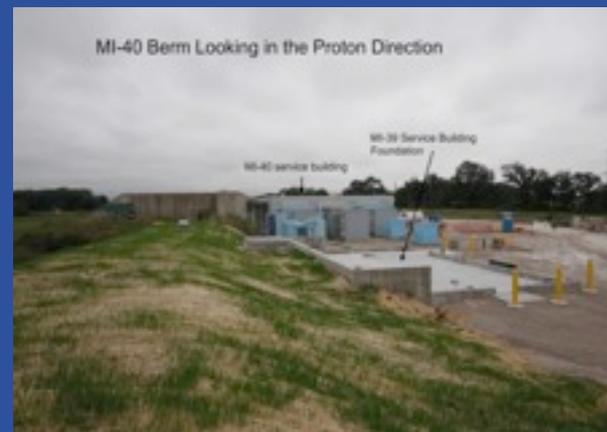
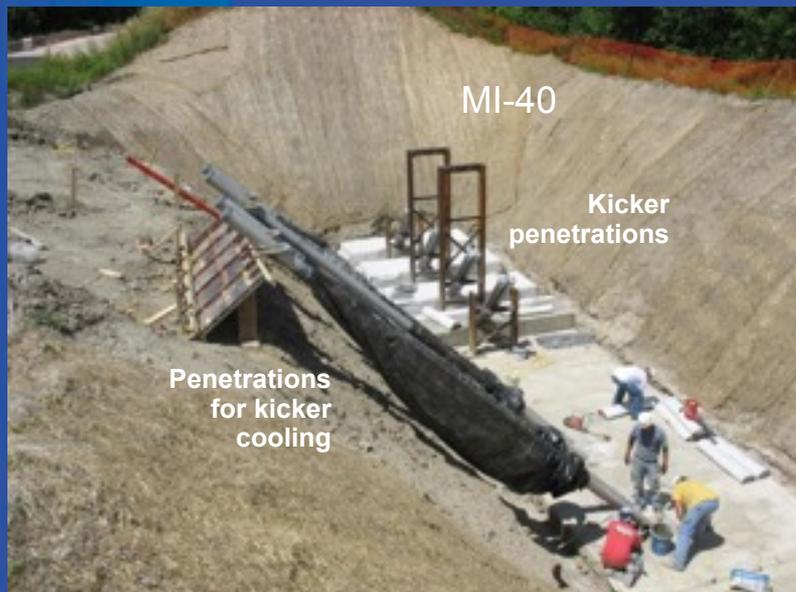
Overview

- Shutdown Plans and Summary
- Projections
- Operations Highlights

Shutdown 2009

- **Booster Corrector Magnets**
 - 10 weeks to install and 2 weeks to commission
- **Main Injector Penetrations**
 - 11 weeks to dig, drill, install, remake berm
 - Eventual install kickers which will clear beam out of the injection time region
- **Tevatron Maintenance**
 - Warmed up 9 houses to fix cold leaks (12 weeks)
- **Antiproton Source Maintenance**
 - Replace leaking magnet and change stochastic cooling tanks
- **Many other maintenance jobs throughout the accelerator complex**

MI Penetrations



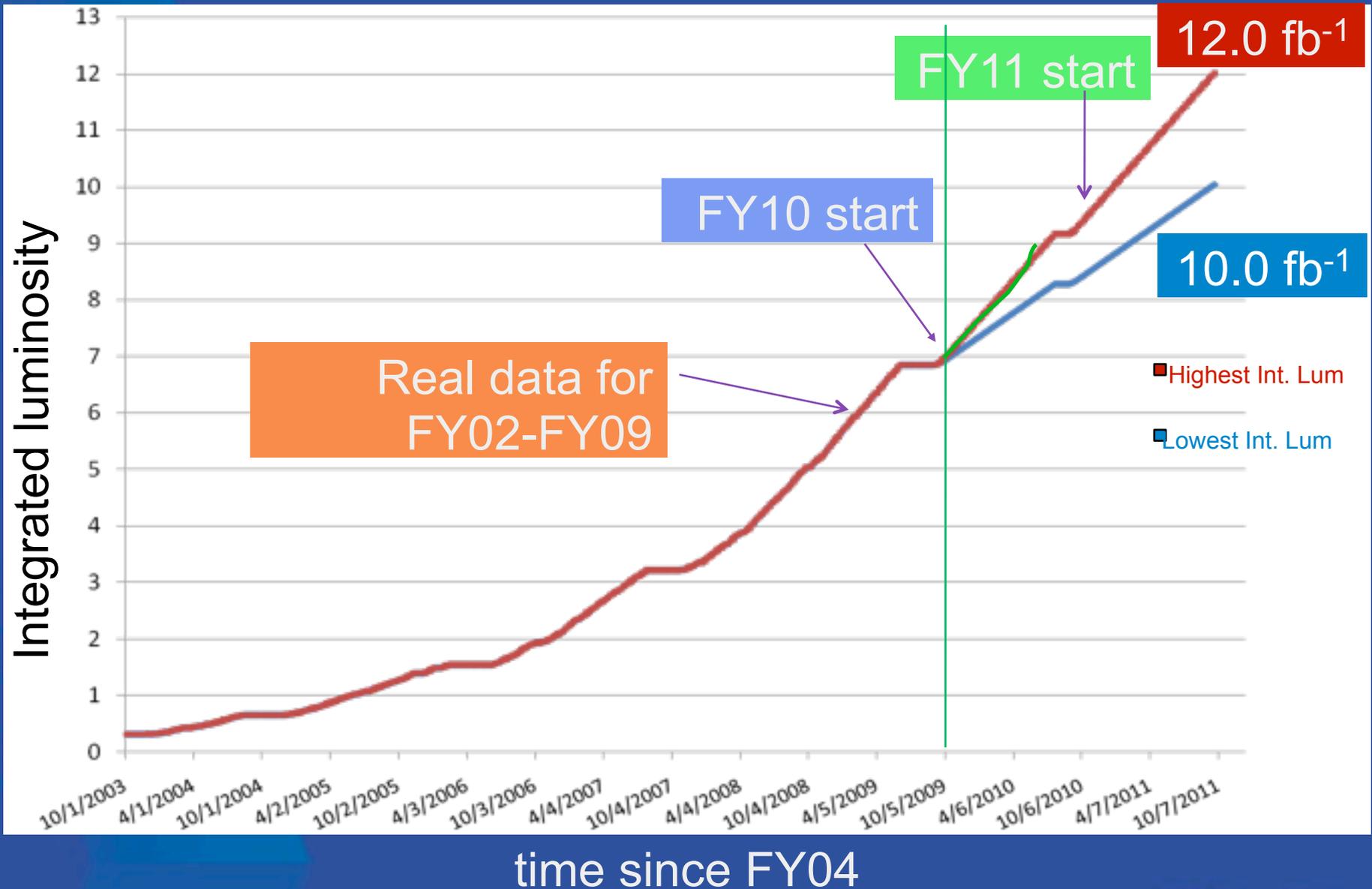
MI-40 Gap Clearing Kickers



Shutdown 2010

- Four Weeks
 - Maintenance in all machines
 - Connect Gap Clearing Kickers in MI
 - Warmup one or two houses in Tevatron for vacuum repairs
 - Unroll approximately 88 Tevatron magnets
 - Electrical System Maintenance
 - NuMI dehumidification repair
 - NuMI target replacement
 - Continue E-906 beam line installation

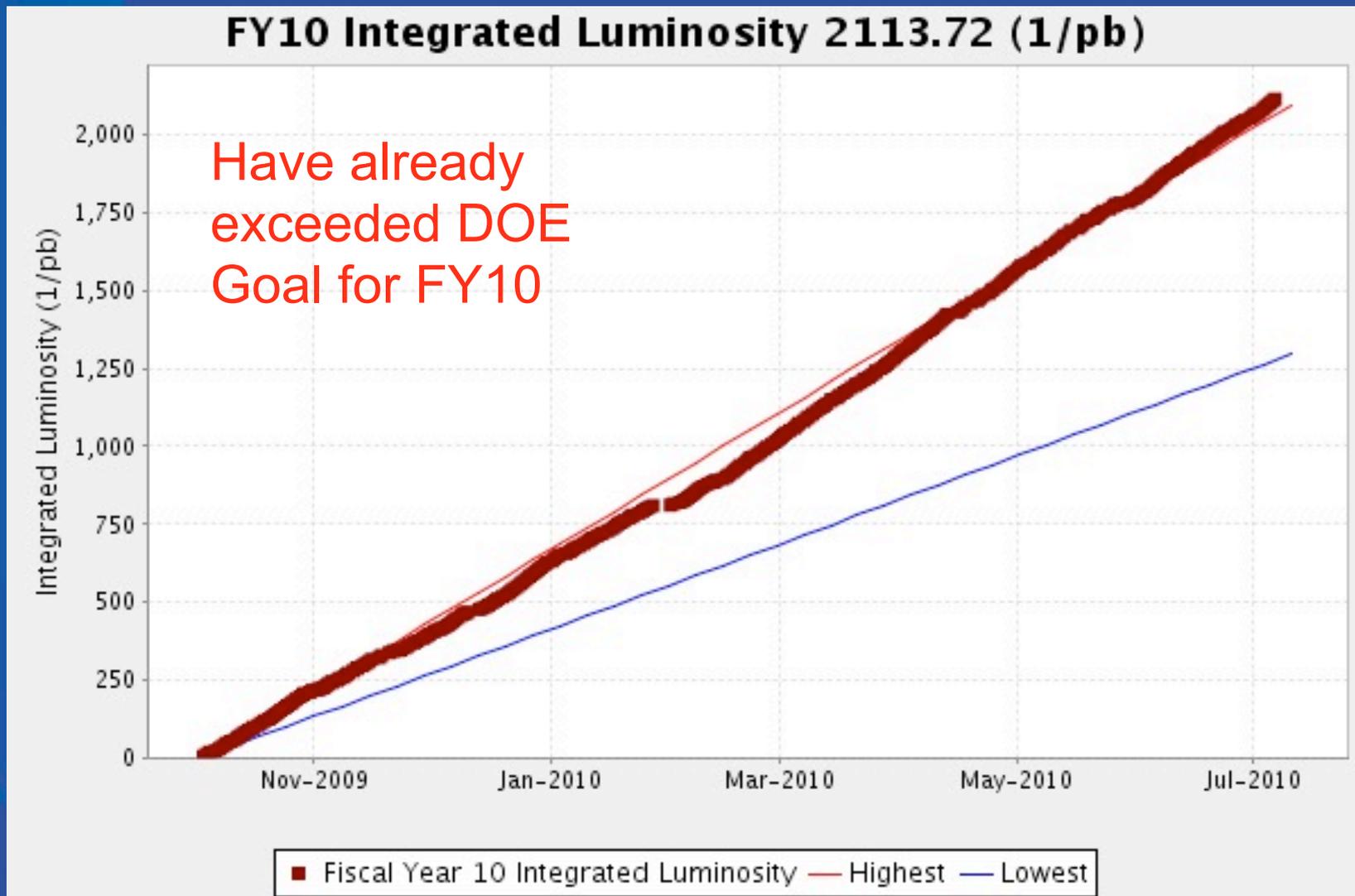
Luminosity Projection Curves for Run II



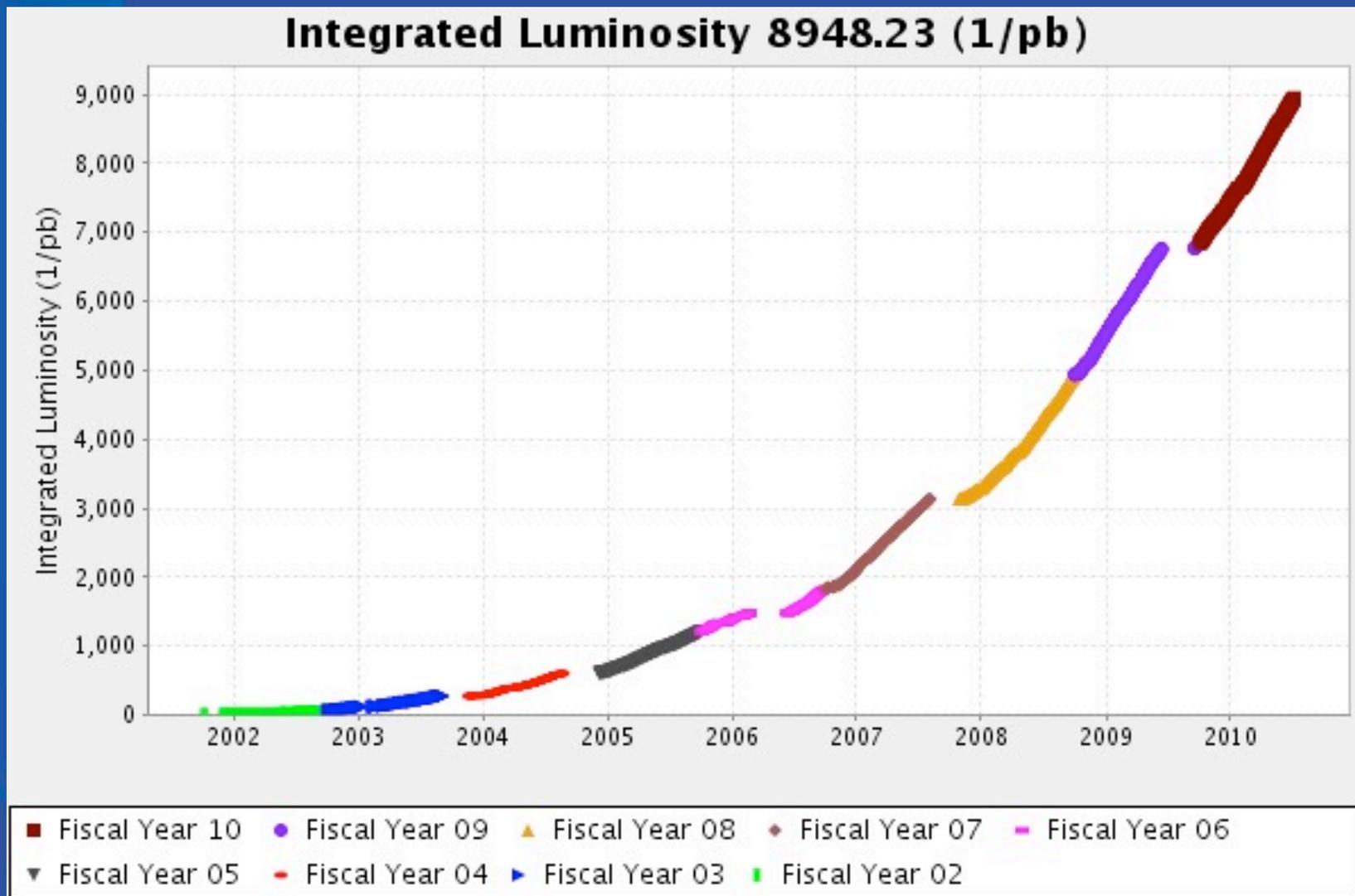
Projection Inputs

- The model predicts weekly integrated luminosity on the basis of 16 input parameters
- The inputs were selected in most cases by looking at the current performance of the machine
- The FY10, FY11 weekly projections are 32.2 pb^{-1} for “minimum” and 52.1 pb^{-1} for “maximum”
- The “maximum” and “minimum” luminosity projections assume, as always, 100 and 120 HEP hours per week, respectively
- The “turn on curve” after the short (4 week) shutdown of 2010 covers 4 weeks, delivering 0%, 30%, 60%, 80% of expected luminosity

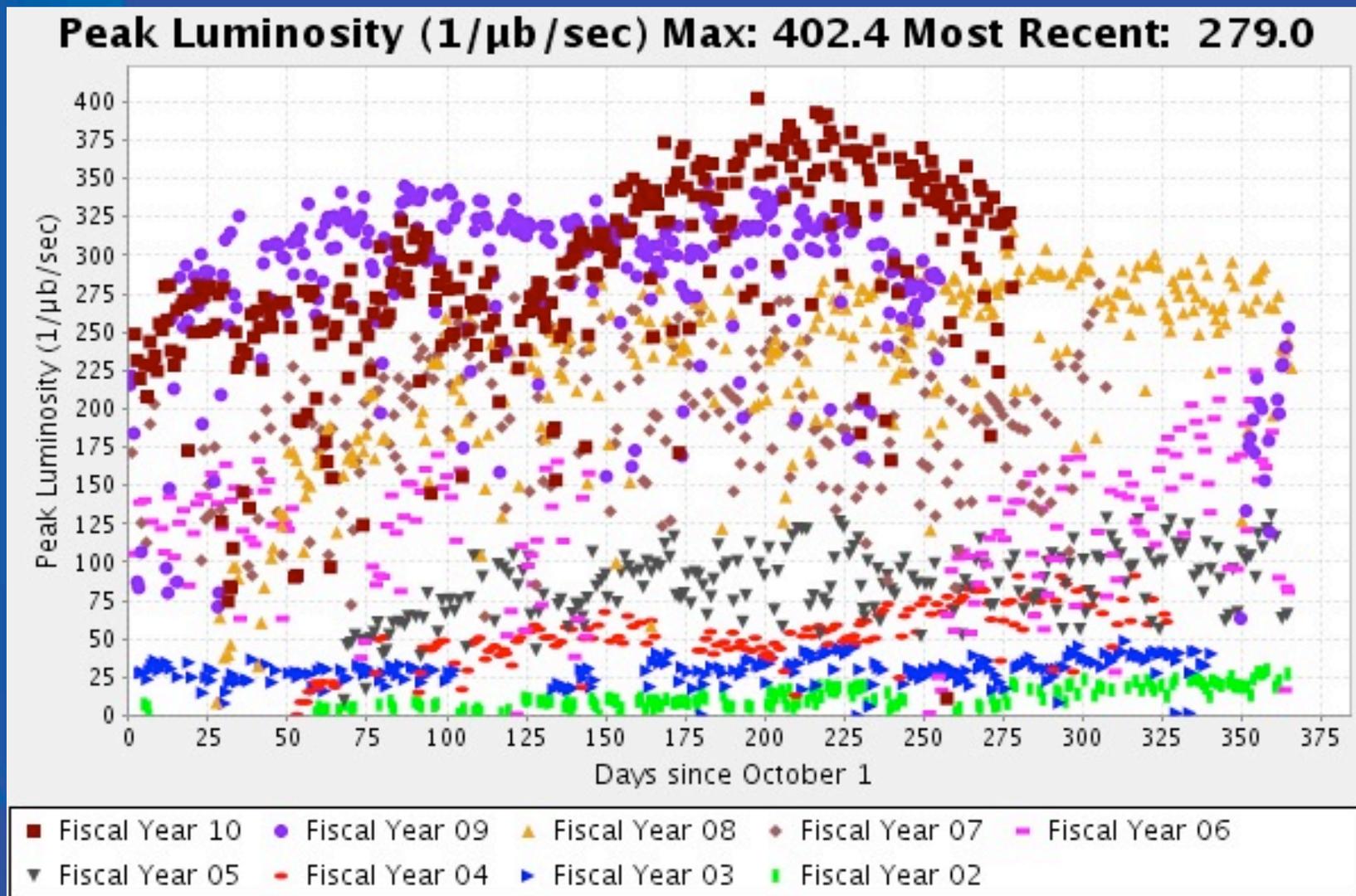
Luminosity Detail



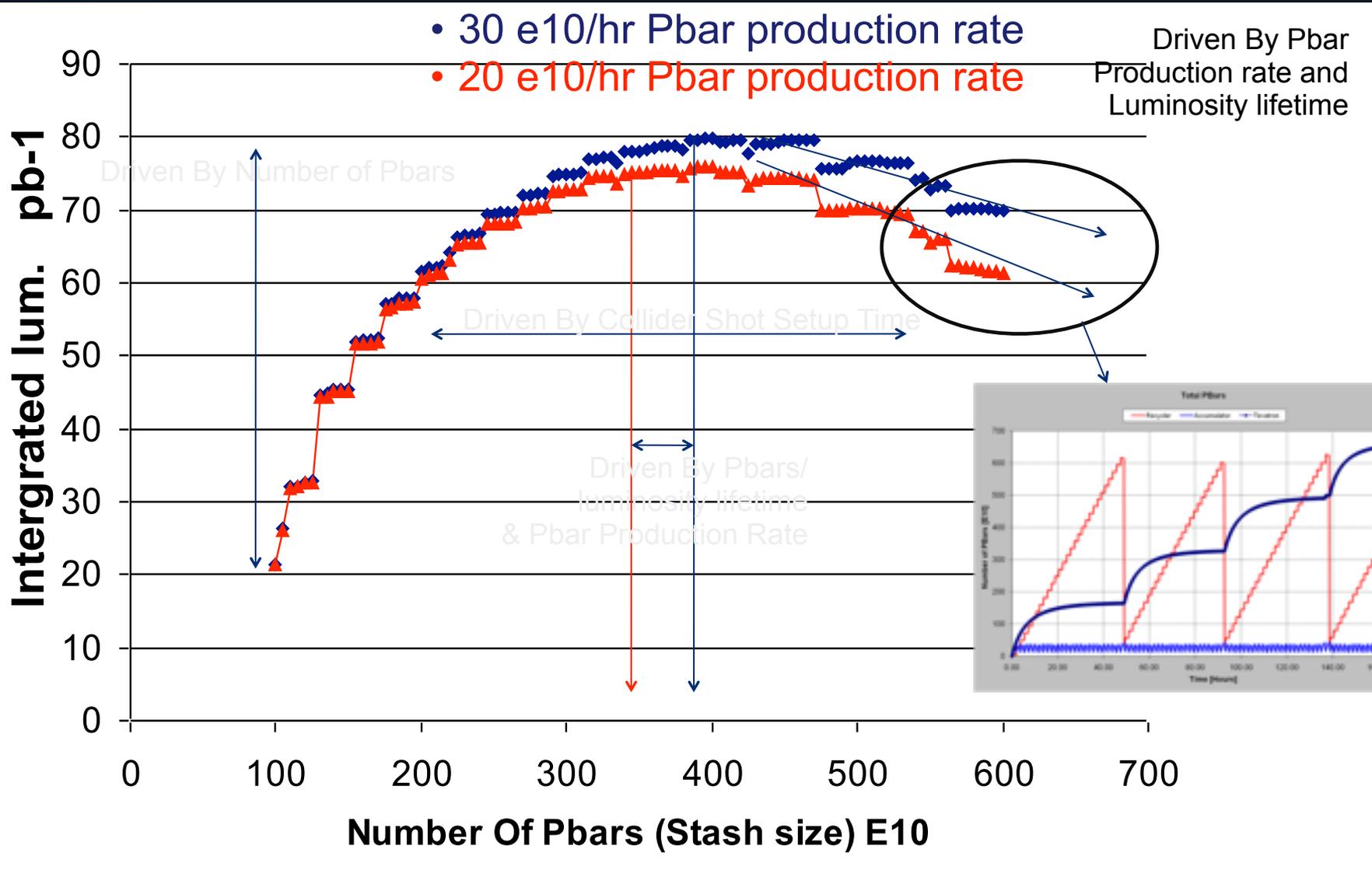
Total Integrated Luminosity



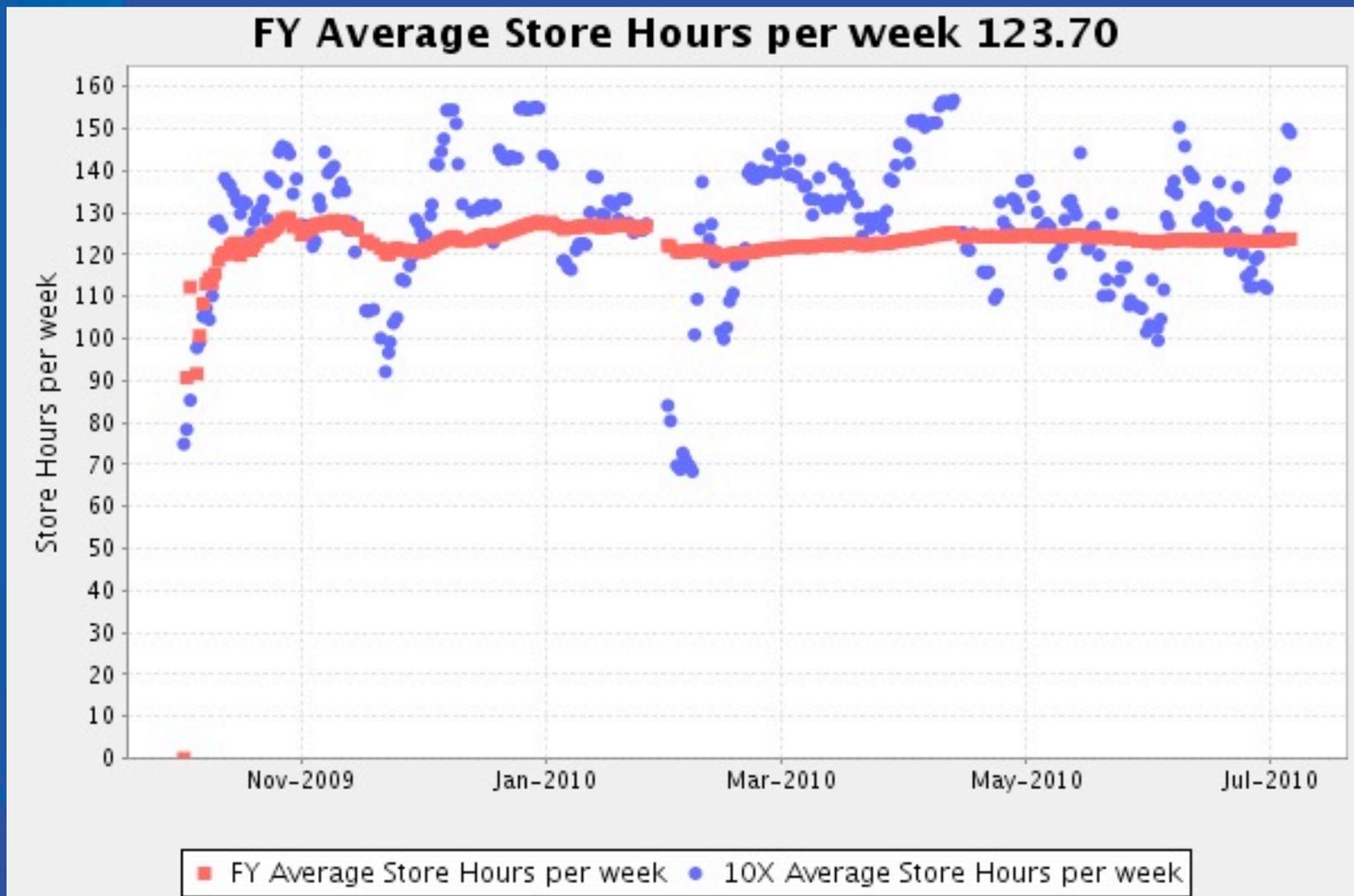
Peak Luminosity Performance



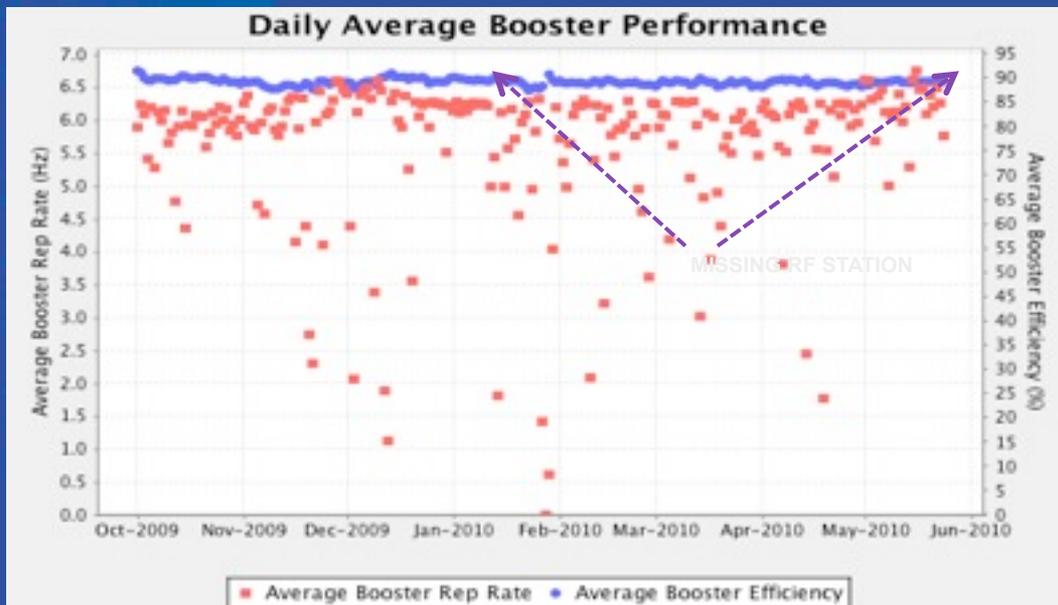
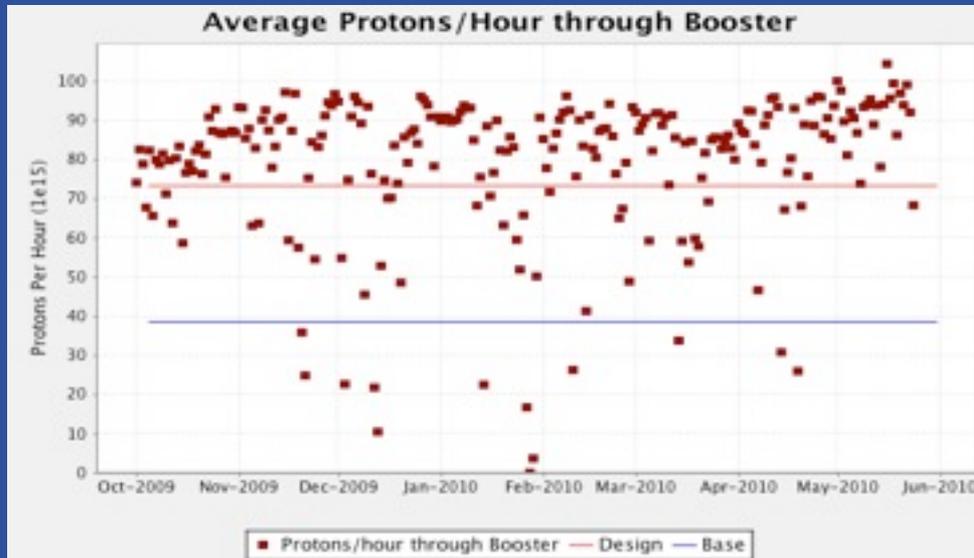
Response of the model



Reliability

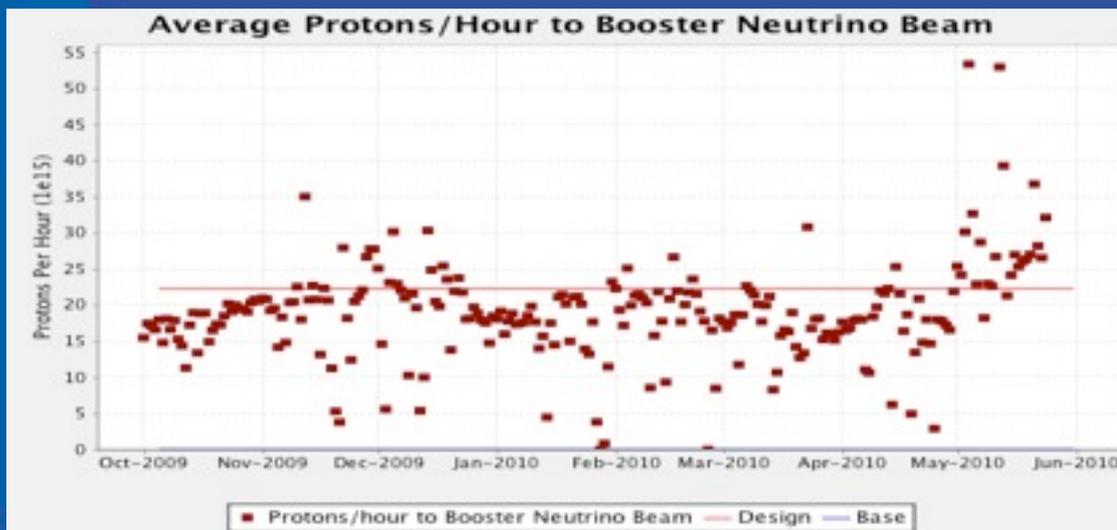
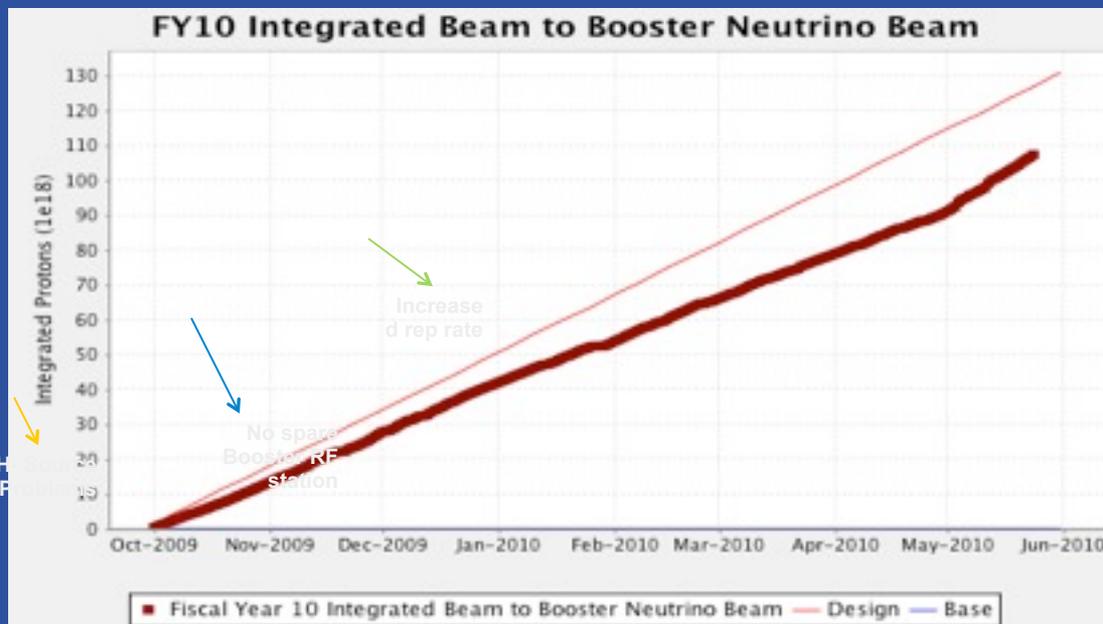


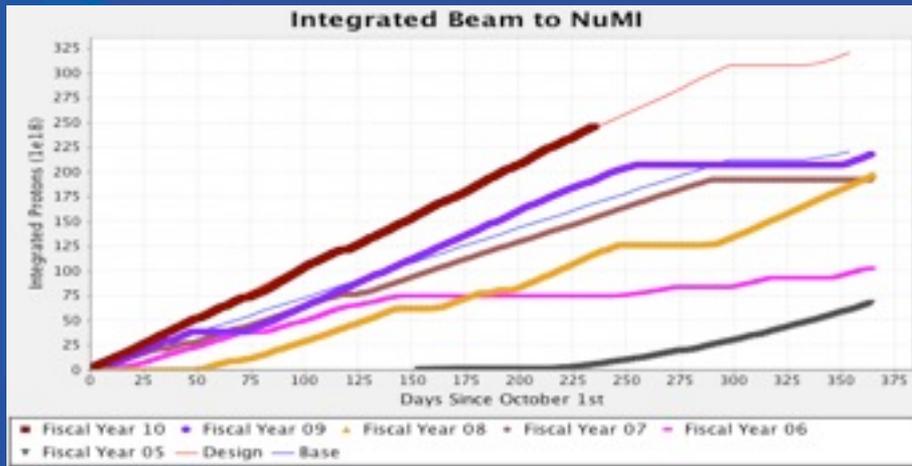
Proton Source Performance



- *For pbar stacking and NuMI we need 5Hz and $7.7E16$ P/h.
- *RF and beam losses is limiting the rep rate and the total protons per hour.
- *Had to reduce the rep rate while running without spare rf station.
- *Problems with the proton source affected both the protons per hour and the beam quality out of Booster.
- *We have started to see the effect of the Booster correctors.
 - *More stable conditions for tuning
 - *Better working point
- *For NOvA we will need 9Hz rep rate and $1.4E7$ P/h.

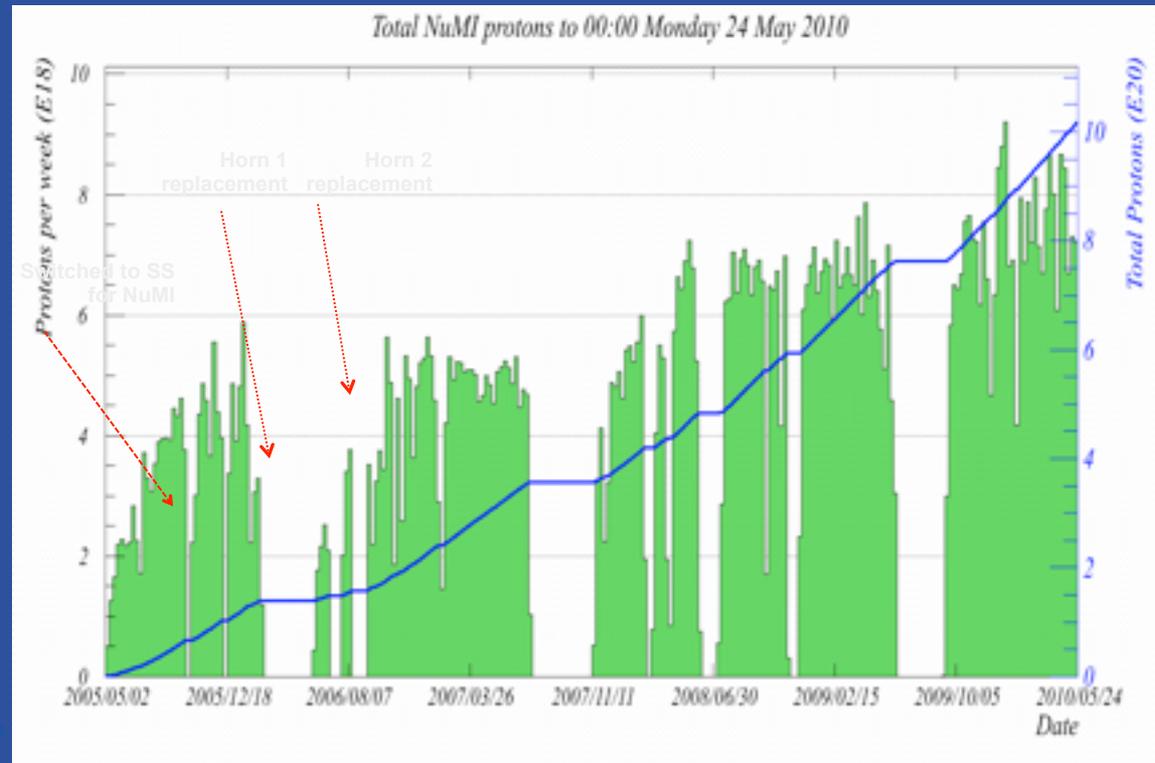
Booster Neutrino Beam





- Have delivered more than 2.2×10^{20} protons this year and more than 1×10^{21} so far!
- No component failures in the NuMI beam line and better MI performance.

Have already exceeded DOE Goal for FY10



Issues

- Source/Cockcroft Walton Failure
 - Had to completely rebuild one column
- Two Booster RF Cavity Failures
- Normal failure rate of Booster RF Power Amplifiers
- Water leak in MI RF Cavity
- Dehumidification failure in NuMI Target Chase
- Deterioration and movement of the NuMI target

Test Beam and Seaquest

- Test beam runs $\leq 50\%$ of time as needed
 - 5% impact on stacking
- Seaquest beam is being installed
 - Commissioning should begin in the fall

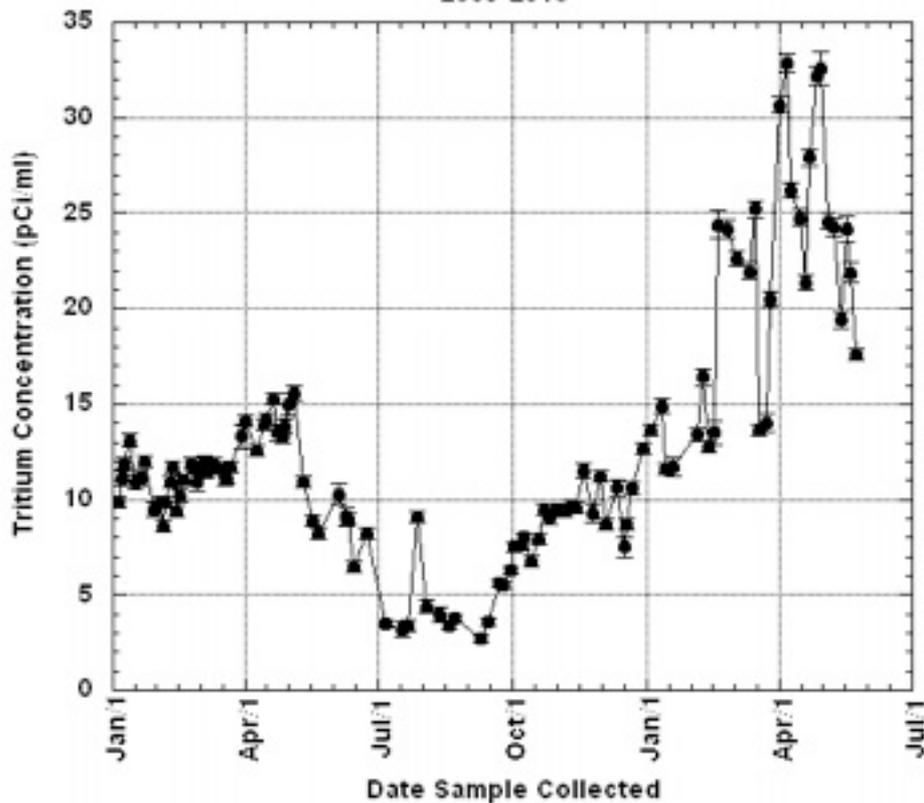
Summary

- Collider running
 - Luminosity has peaked
 - Running conditions being optimized
- Neutrino beams running with good reliability even though some weaknesses in the Proton Source are becoming more evident
- Have exceeded DOE goals for Collider and NuMI
- Test beam also running \leq half the time
- Seaquest installation underway

Backup Slides

NuMI Tritium Mitigation

NuMI ICW Holding Tank
2009-2010



Indian Creek at the Prairie Path
2005-2010

