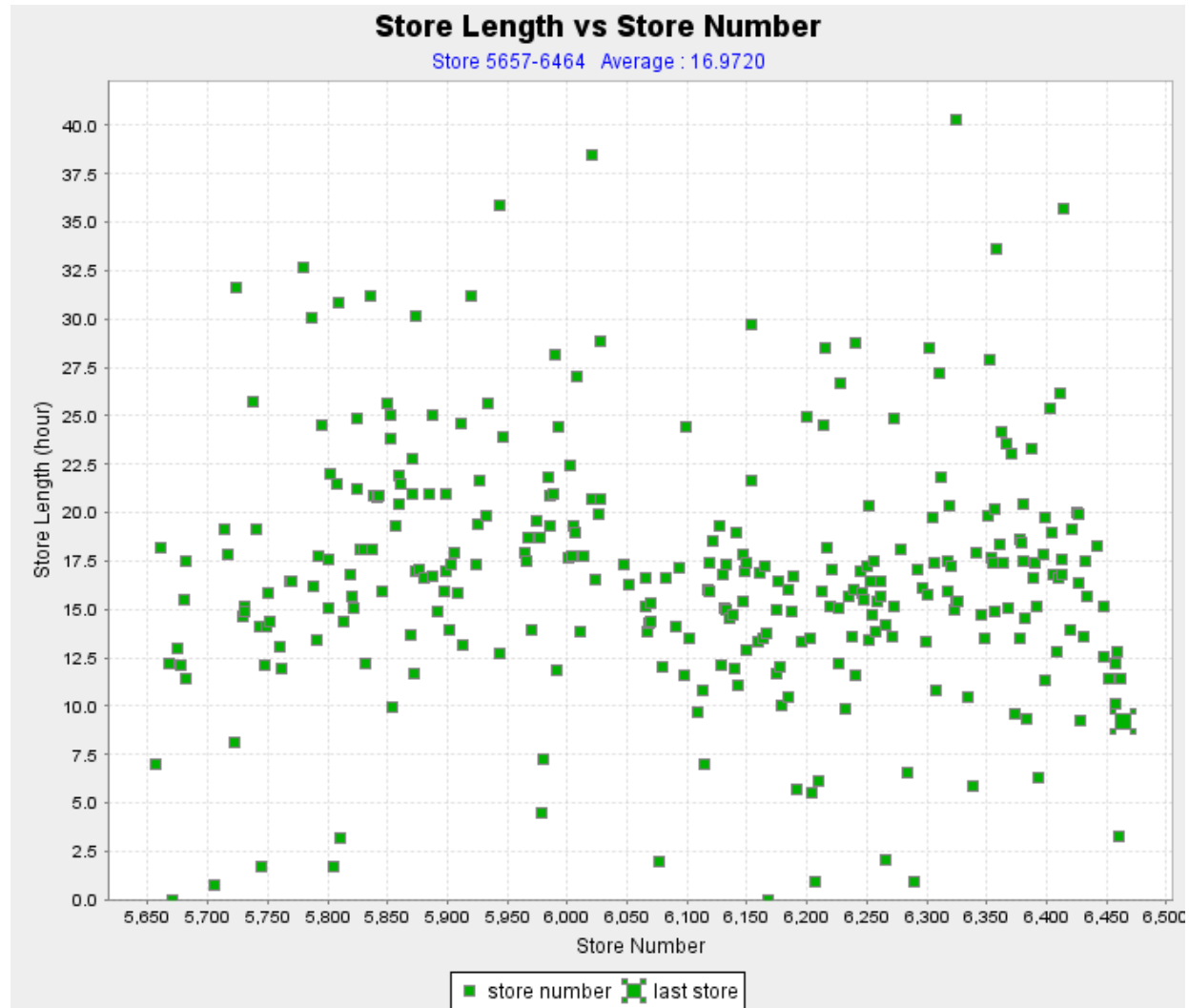


A few performance plots for
FY08 and FY09 to justify changes
in model parameters for
integrated luminosity
projections for the last three
quarters of FY09 and for FY10

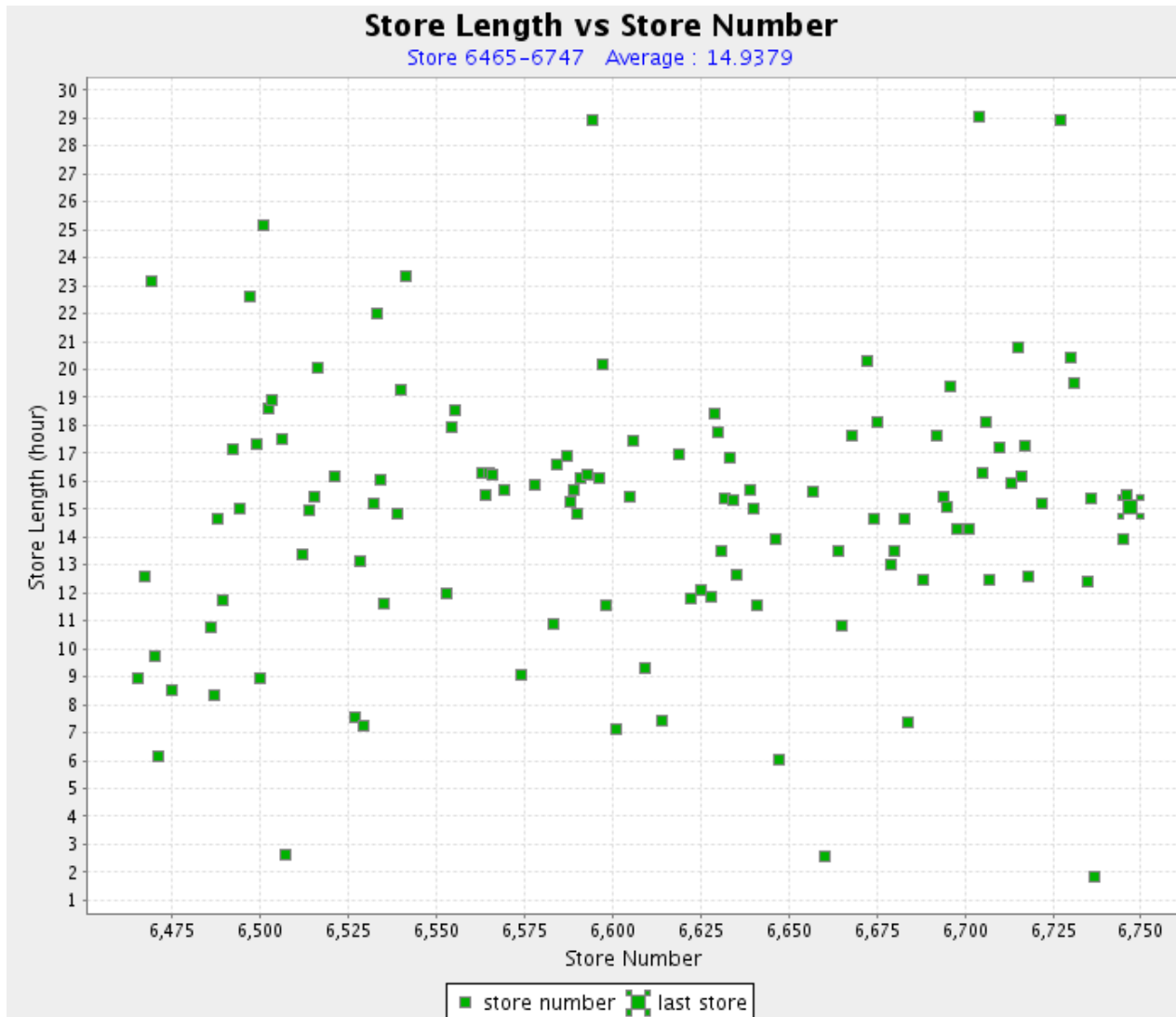
Vaia Papadimitriou

February 5, 2009

Store length – FY08

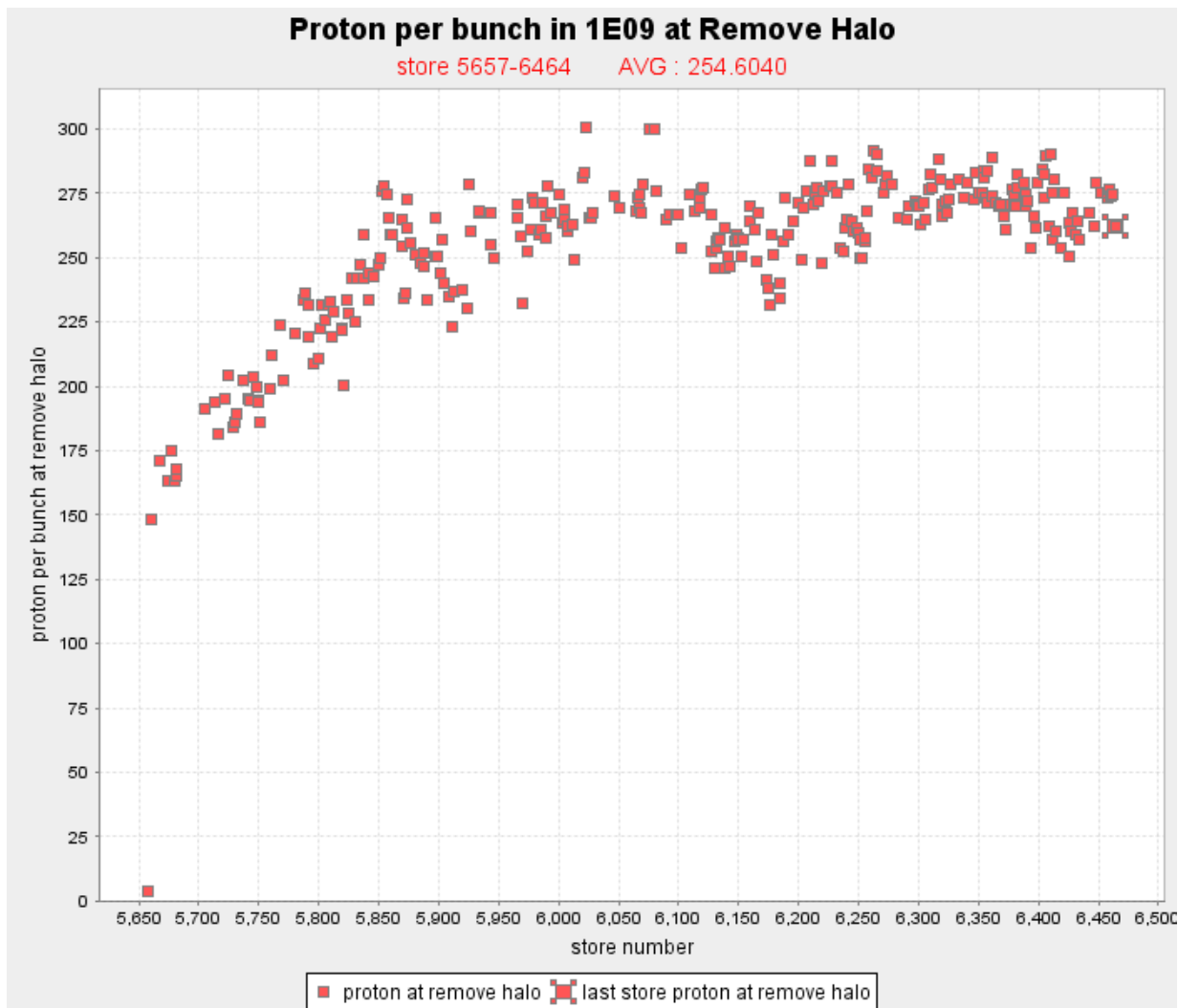


Store length – FY09



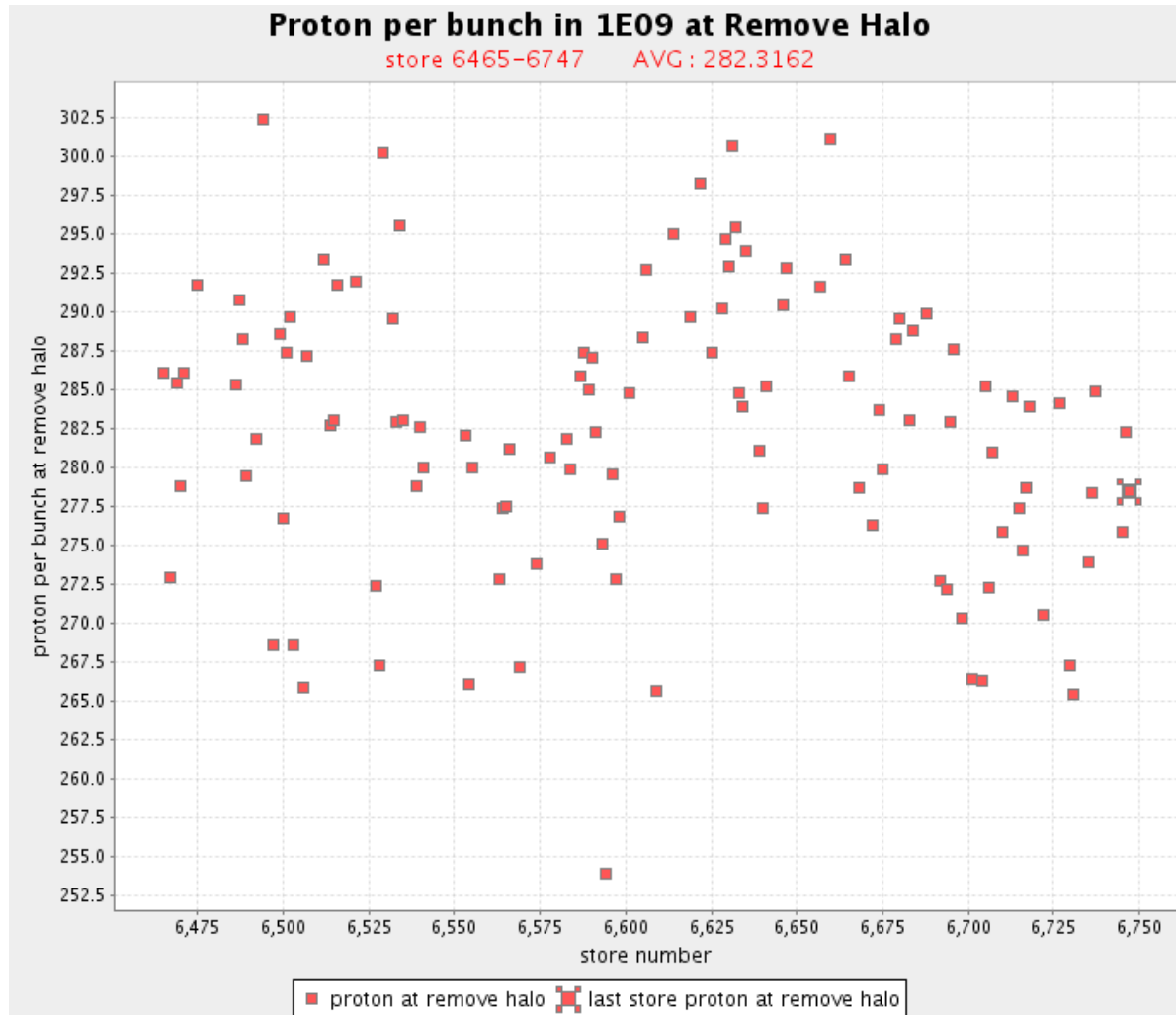
Protons/bunch at Remove Halo

FY08



Protons/bunch at Remove Halo

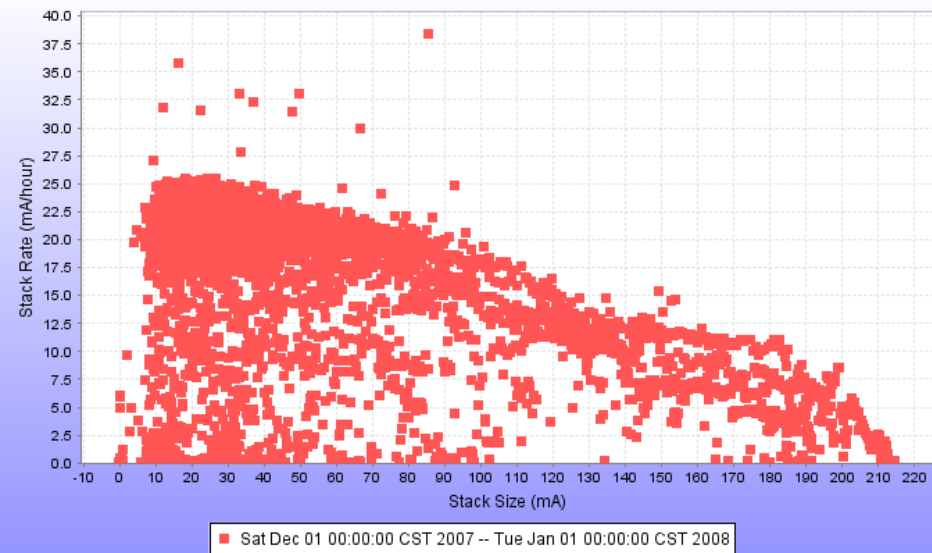
FY09



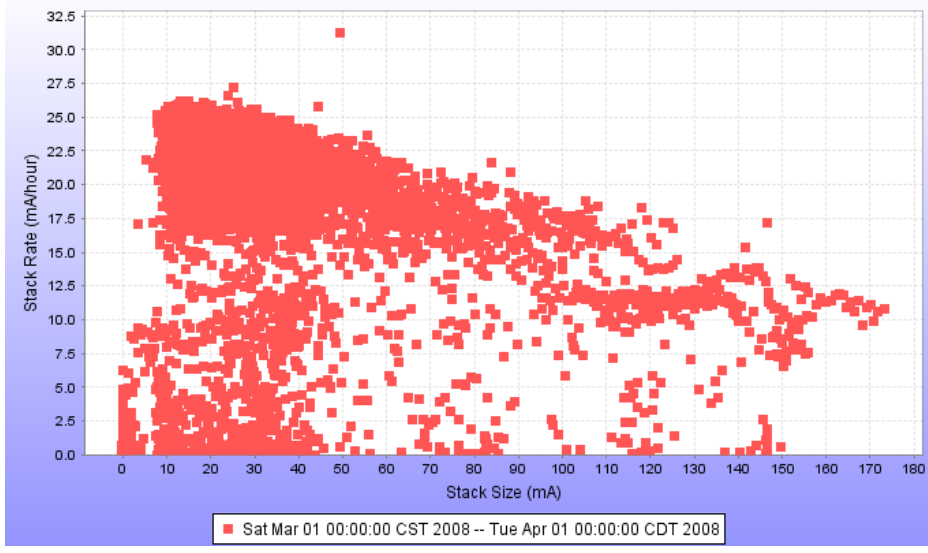
Stacking rate vs stack size

December 2007 and March, April and May, 2008

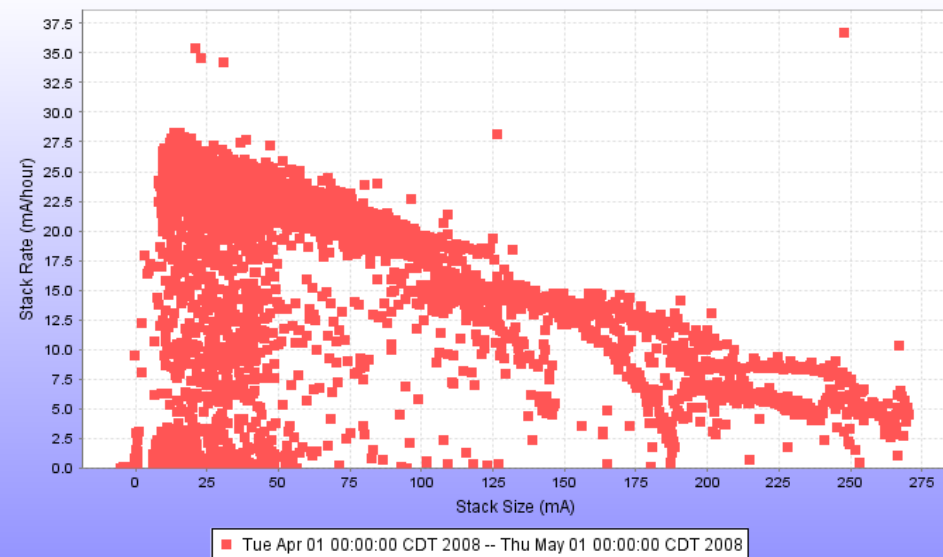
Stack Rate vs Stack Size



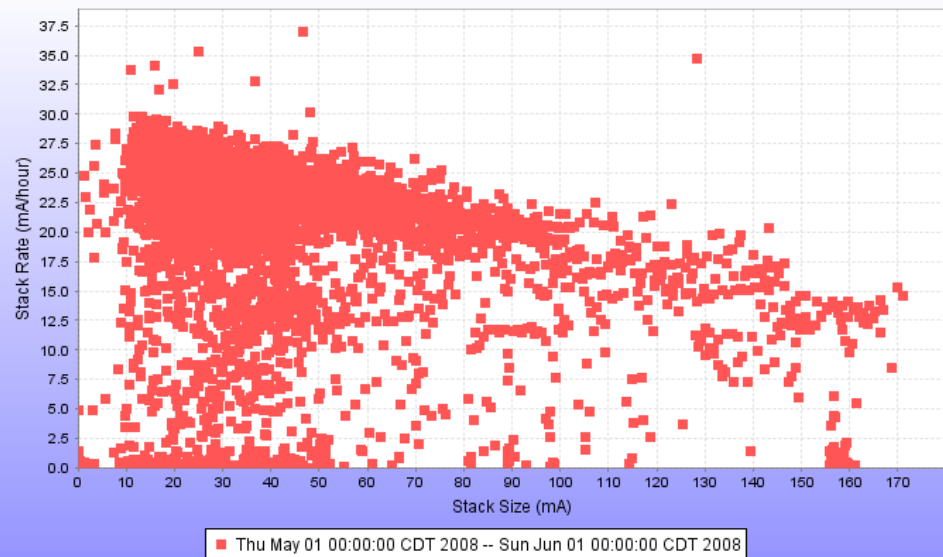
Stack Rate vs Stack Size



Stack Rate vs Stack Size



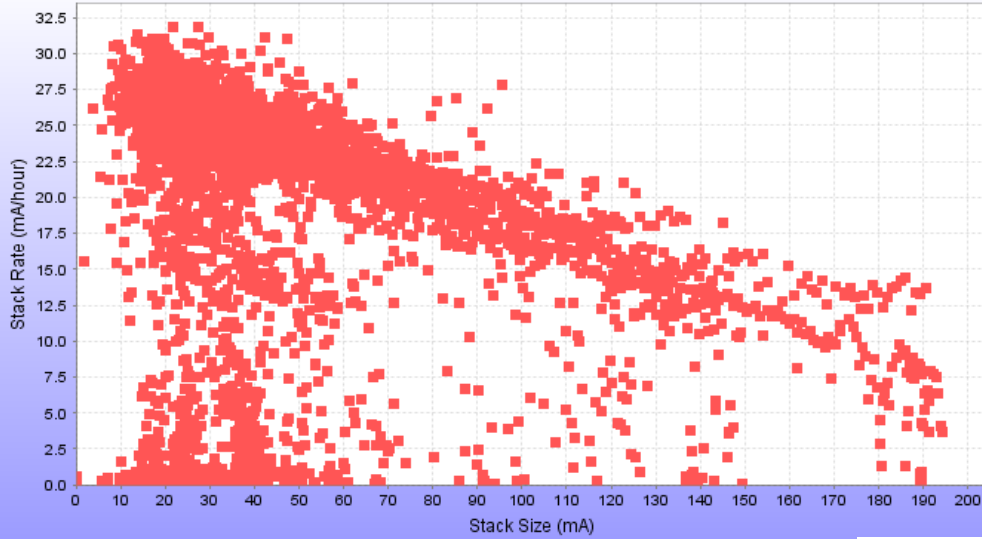
Stack Rate vs Stack Size



Stacking rate vs stack size

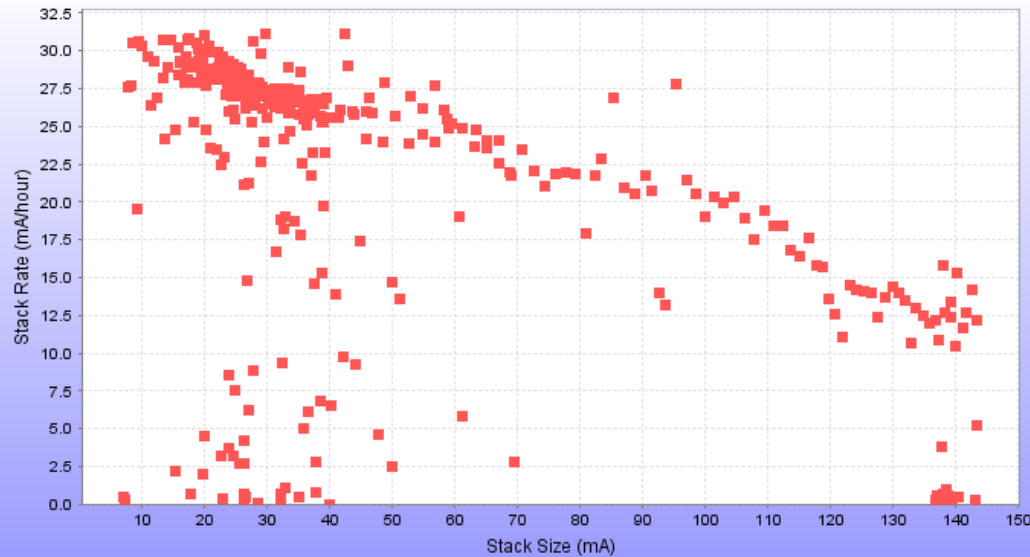
December, 2008

Stack Rate vs Stack Size



Mon Dec 01 00:00:00 CST 2008 -- Wed Dec 31 00:00:00 CST 2008

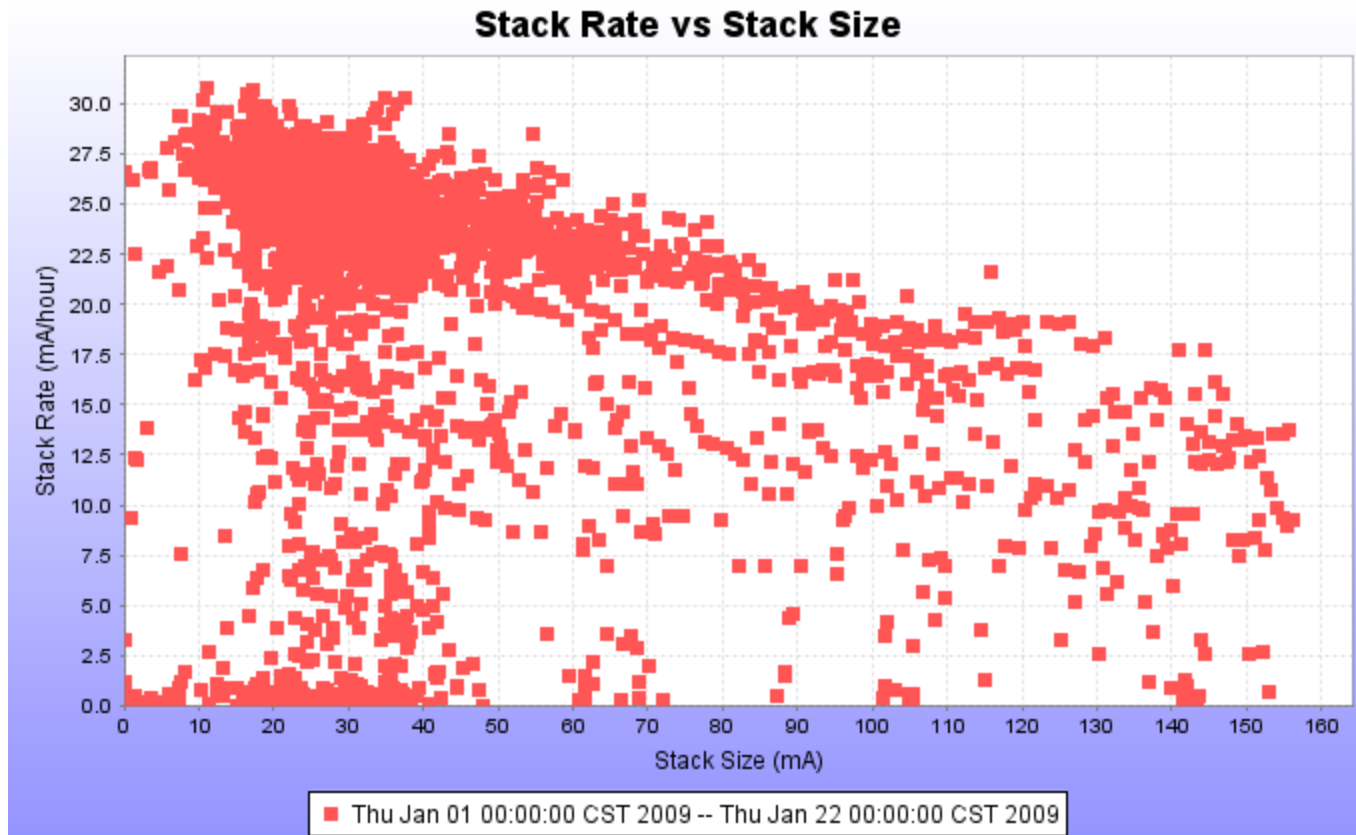
Stack Rate vs Stack Size



Thu Dec 18 00:00:00 CST 2008 -- Sat Dec 20 00:00:00 CST 2008

Stacking rate vs stack size – FY09

January 1-22, 2009



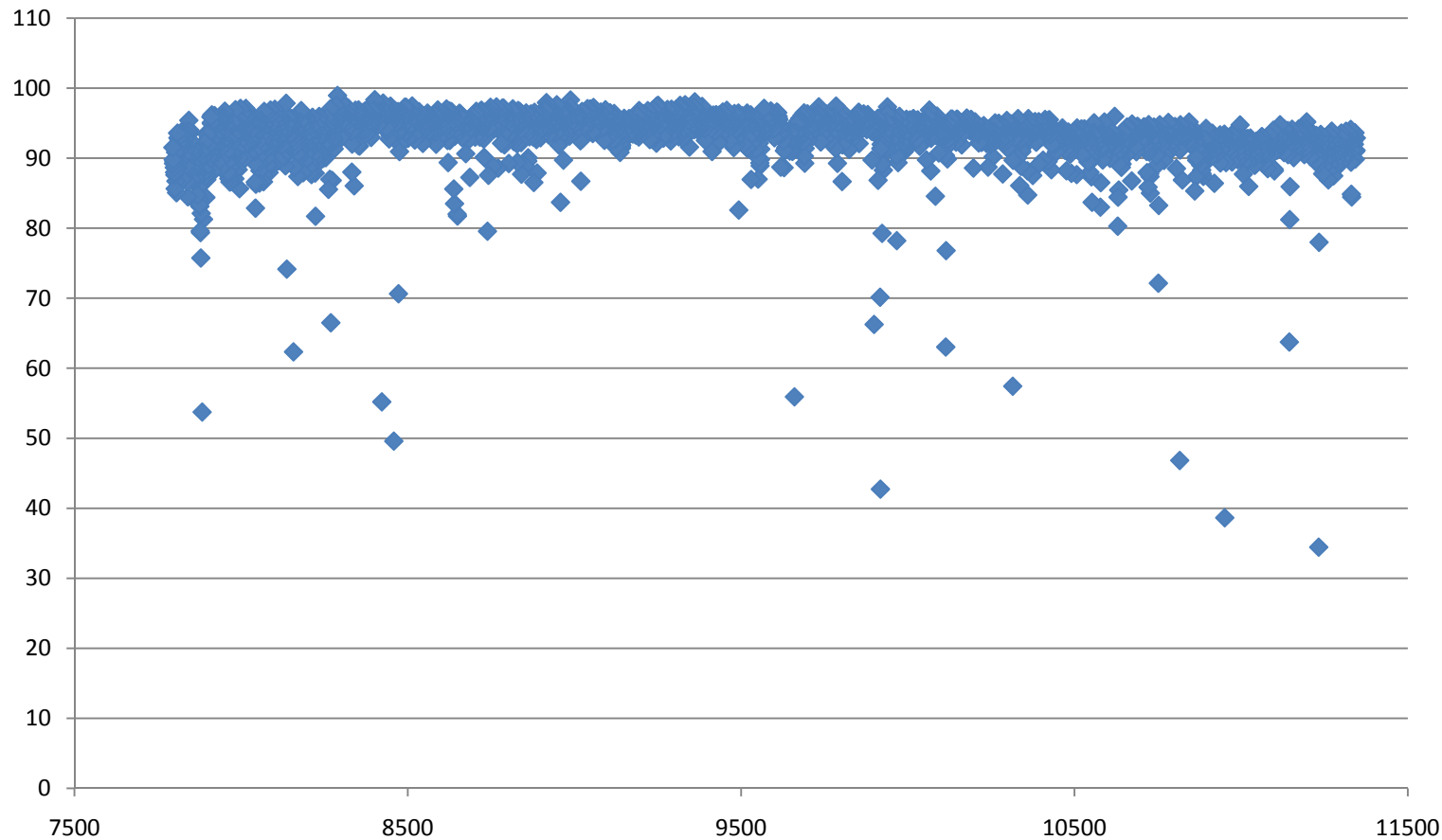
Transfer efficiency for Recycler transfers

May. 1, 2008 - Jan. 30, 2009

Total transfer efficiency (sum) vs pbar shot number

Avg: 93.4%

Avg Dec08-Jan09: 92.1%



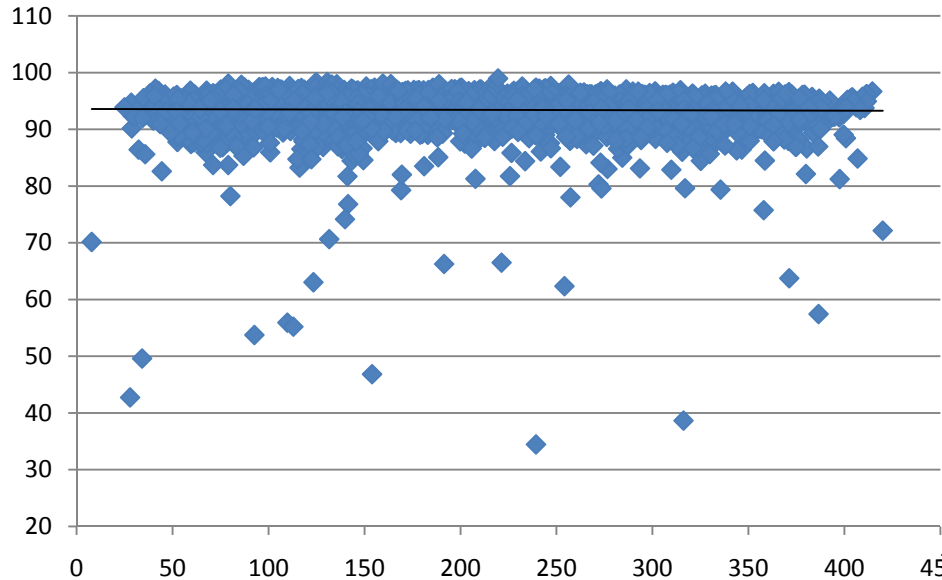
Transfer efficiency for Recycler transfers

May. 1, 2008 - Jan. 30, 2009

Total transfer efficiency (sum) vs stash

size

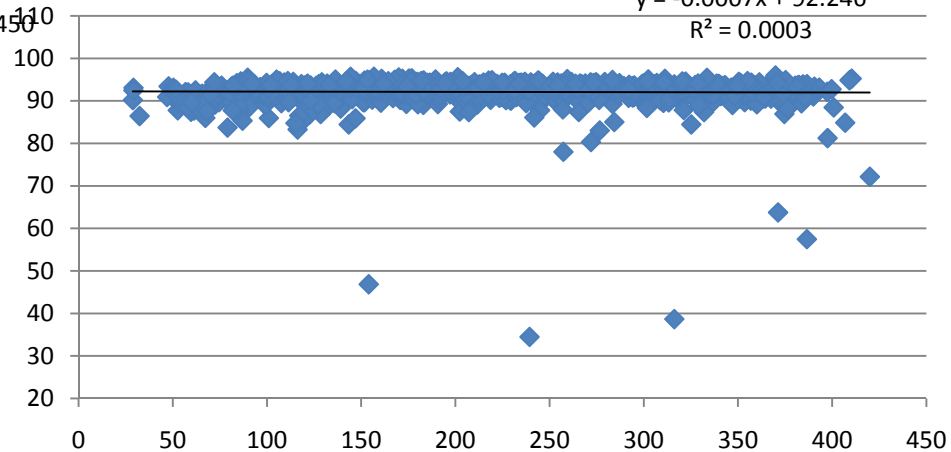
$$y = -0.0007x + 93.572$$
$$R^2 = 0.0004$$



For “maximum” lum projection we now assume 92% for stashes of 0 mA and 91% for stashes of 300 mA. Since we are still on the low side we will leave this as is for now and revisit a few months later.

Total transfer efficiency (sum) vs stash size (Dec 08-Jan 09)

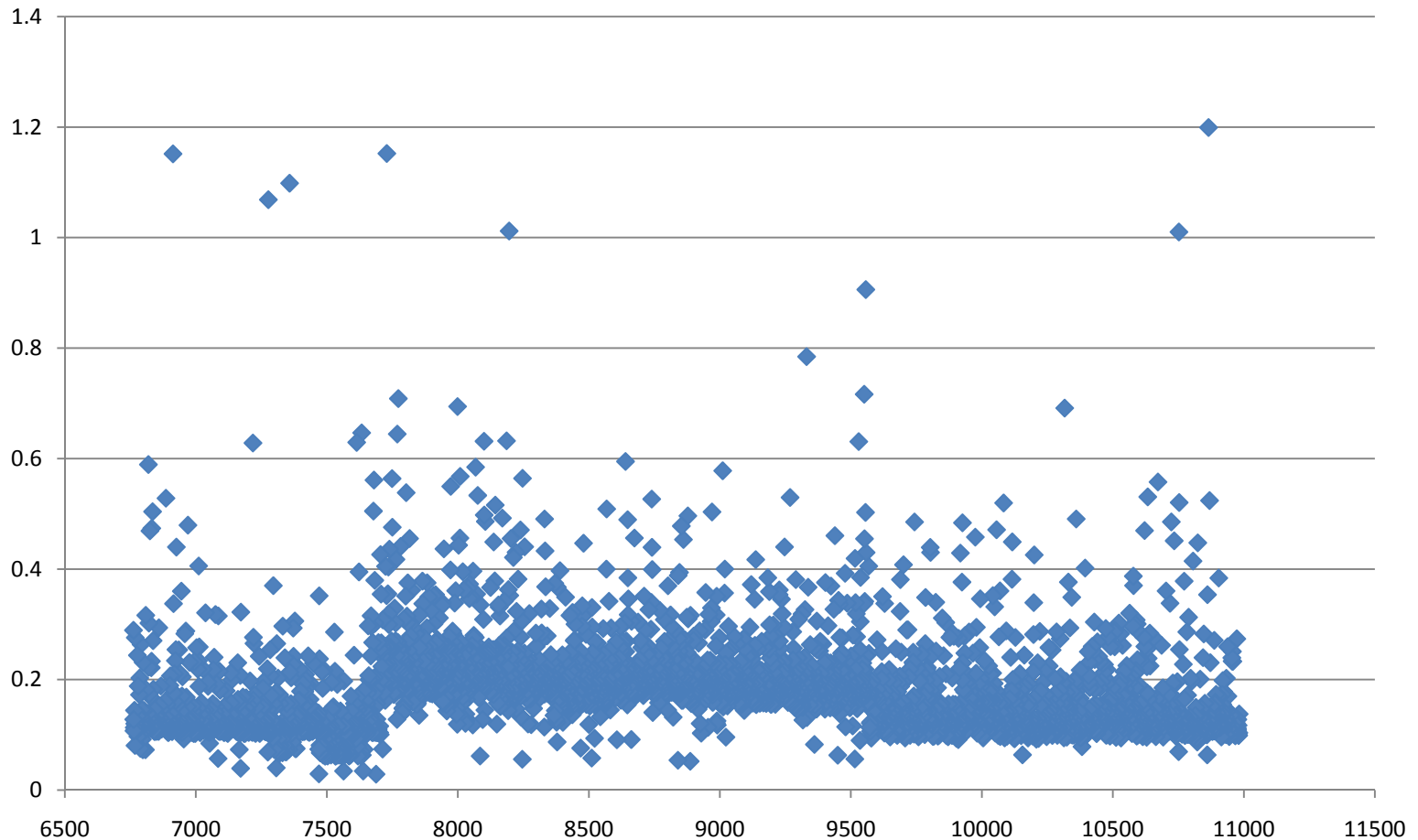
$$y = -0.0007x + 92.246$$
$$R^2 = 0.0003$$



Transfer time for Recycler transfers

Jan. 1, 2008 - Jan. 10, 2009

delay between transfers in hours vs pbar shot number



Parameters that changed for updated luminosity model projections

The original FY09 weekly projections were 29.72 pb⁻¹ for “minimum” and 41.79 pb⁻¹ for “maximum”. They basically remained (intentionally) the same as they were for FY08, with a slight increase in slope for “maximum”.

Some changes are being implemented now (initially intended for FY10) for the last three quarters of FY09 and for FY10. They are outlined below:

- ❑ store length from 20 hours to 14 hours for “maximum” and from 21 hours to 20 hours for “minimum” (this is because of higher stacking rate).
- ❑ protons per bunch at “Remove Halo” from 270 e9 to 280 e9 for FY09 and to 285 e9 for FY10 for “maximum”, and from 260 e9 to 265 e9 for “minimum” for both FY09 and FY10.
- ❑ peak stacking rate from 27 mA/h to 30 mA/h for “maximum” and from 22 mA/h to 23 mA/h for “minimum”.
- ❑ the “turn on curve” after the long shutdown of 2009 has also been changed from three weeks delivering 0%, 50%, 90% of expected luminosity to five weeks delivering 0%, 30%, 50%, 70%, 90% of expected luminosity.

The “maximum” and “minimum” luminosity projections assume, as always, 100 and 120 HEP hours per week respectively.

Weekly and integrated luminosity projections for FY09 and FY10

These changes lead to FY09 weekly projections of 30.89 pb^{-1} for “minimum” and 48.09 pb^{-1} for “maximum” which are being implemented since January 4, 2009.

The weekly projections for FY10 are 30.89 pb^{-1} for “minimum” and 48.87 pb^{-1} for “maximum”.

The resulting integrated luminosity projections for FY09 are 1166.9 pb^{-1} for “minimum” and 1761.8 pb^{-1} for “maximum”.

The resulting integrated luminosity projections for FY09 and FY10 are 2777.6 pb^{-1} for “minimum” and 4310.0 pb^{-1} for “maximum”.