

Collimation on the Ramp

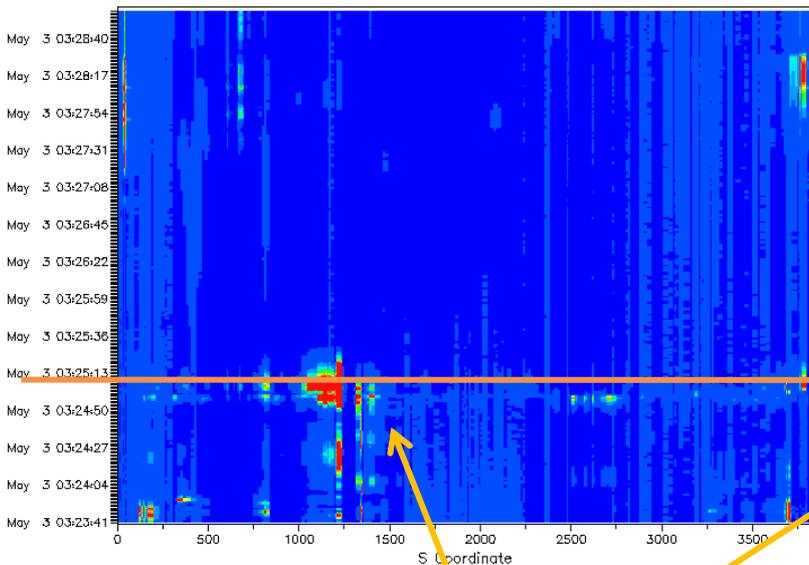
Or before?

Situation

- Losses during the ramp could cause quenches
- Losses during the ramp could cause aborted ramps and loss of time even w/o quenches
- Halo cause high experimental backgrounds early during the store
 - Collimation during early store is time consuming and potentially dangerous (could loose store)
- It would be beneficial to contain losses in a shielded area

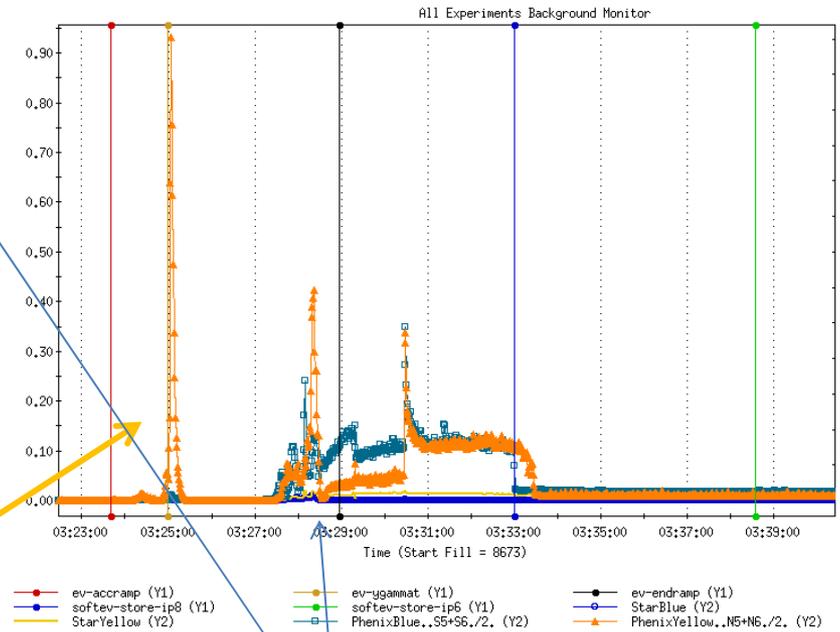
Typical Ramp FY07 (Au)

BLM Ring Avg. 1Hz (on the ramp)

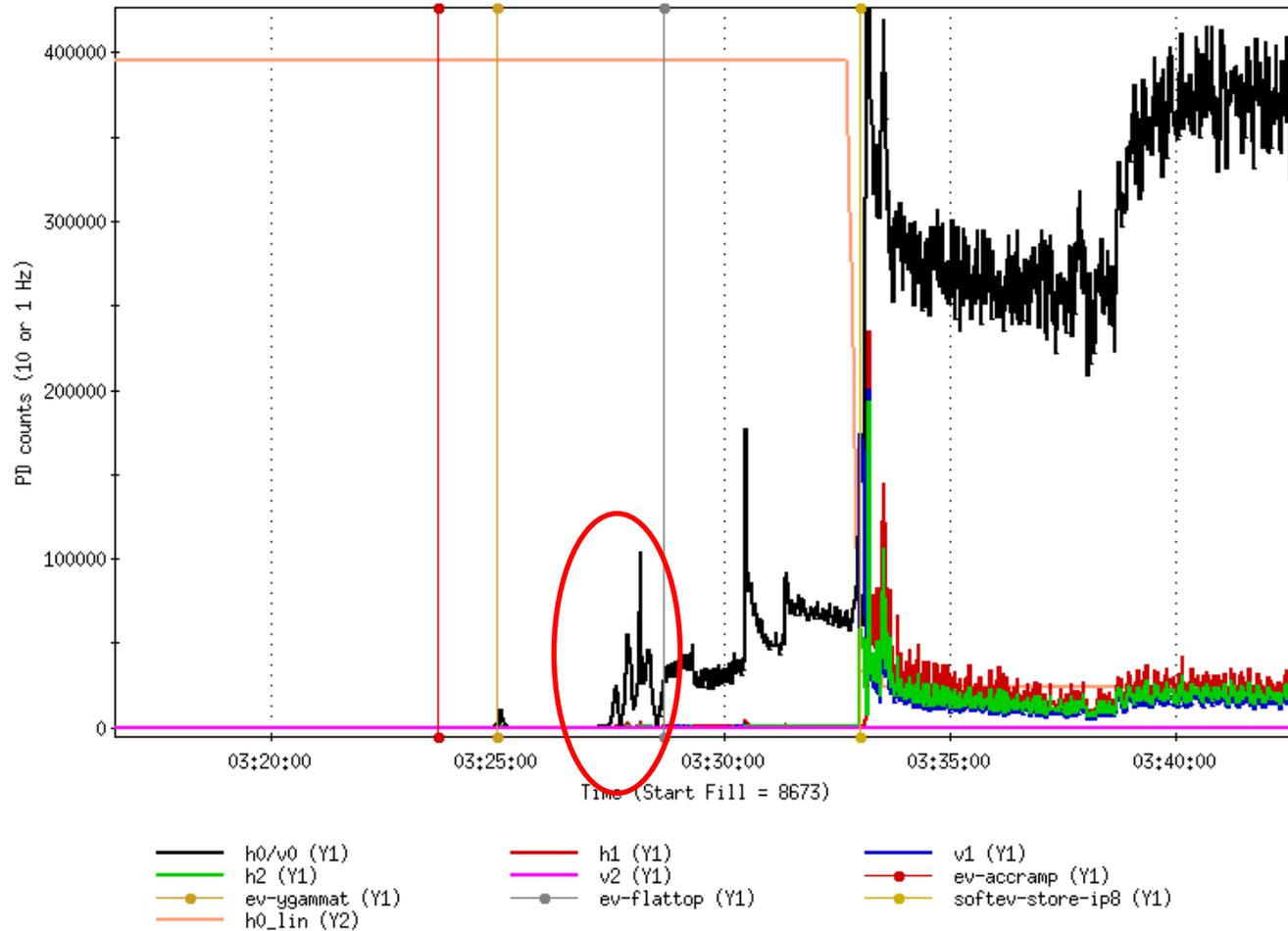


Losses at transition

Exp. Background Signals during the ramp and early store



losses during the squeeze



Pindiode signal on the ramp (8673)

Practically no losses during the ramp but at the end of the squeeze. Could collimators be positioned such that they help taking away losses from scraping during the ramp? Orbit changes are fast (and large) at the end of the ramp.

Collimation at Injection

- Start to collimate at injection with one beam in the machine (machine setup mode)
- Repeat with other ring/species (machine setup mode)
- Determine how much halo is created during the ramp (collimate before and after)
- Operation (depending on results);
 - Bring in blue collimators while yellow is filled
 - Bring in yellow collimators during early ramp
 - Determine requirements on orbit stability in early ramp

Collimation during the ramp

- Was done once, so what's the big deal?
 - Much less beam intensity, relaxed BLM thresholds
 - Constant collimator positions during the ramp
- If halo is created during the ramp and collimation during squeeze looks beneficial:
 - Bring in collimators and keep them there
 - Move beam to collimators (or keep stable in that area)
 - Determine requirements on orbit stability
 - What residual movement is allowed/how close should collimators be?
 - Need APEX time to try things out

Collimator Manager

Implementation:

Add another "tab" for position of collimators during the ramp

Add another "tab" for position of collimators at injection

The screenshot displays the collManClient software interface, which is used for managing collimators. The interface is divided into several sections:

- Beam Data:** Shows the current collimator configuration for the "Blue Ring". It includes a table for Sigma and Emit. values, and input fields for Prim Max Speed (2000), Sec Max Speed (15000), SecH Max Speed (15000), and Skew Max Speed (7000). There is also a checkbox for "Use IPM Data".
- Operation Modes:** A set of buttons for controlling the collimator, including "Stand By", "Go To", "Move Closer", "Store", and "Home".
- Mask:** A table showing the mask configuration for different collimators (h0, v0, h1, v1, h2, v2).
- StandBy Setting Data #:** A field for entering the standby setting data number, with "Load Setting Data" and "Save Setting Data" buttons.
- Scrapper Moving Progress:** A progress indicator showing the status of six scrapers (h0, v0, h1, v1, h2, v2).
- Average Pin Diodes Data:** A graph showing the average pin diode counts over time for various collimators (h0/v0, h1, v1, h2, v2).
- Beam Background Rates:** A graph showing the beam background rates for all experiments, including StarBlue (BBC delayed), StarYellow (BBC delayed), PhenixBlue (S5 Sci), and PhenixYellow (N5 Sci).
- LVDT Scrapper Positions:** A graph showing the LVDT positions (in mm) for the scrapers over time.
- Current Collimator Status:** A log window displaying the current status and any error messages, such as "Cannot get sigma Horiz data" or "Could not start standby mode".

Proposal

- Try collimation at injection first
 - Determine how much halo is created during the ramp and if species dependend
 - Determine time needed to bring collimators into position and required orbit stability
 - Make operational (APEX?, update manager)
- If needed, collimate during the ramp
 - Determine orbit stability needed
 - Determine time needed to move collimators
 - Keep beam stable in that area (APEX?)
 - Make operational (update manager)