

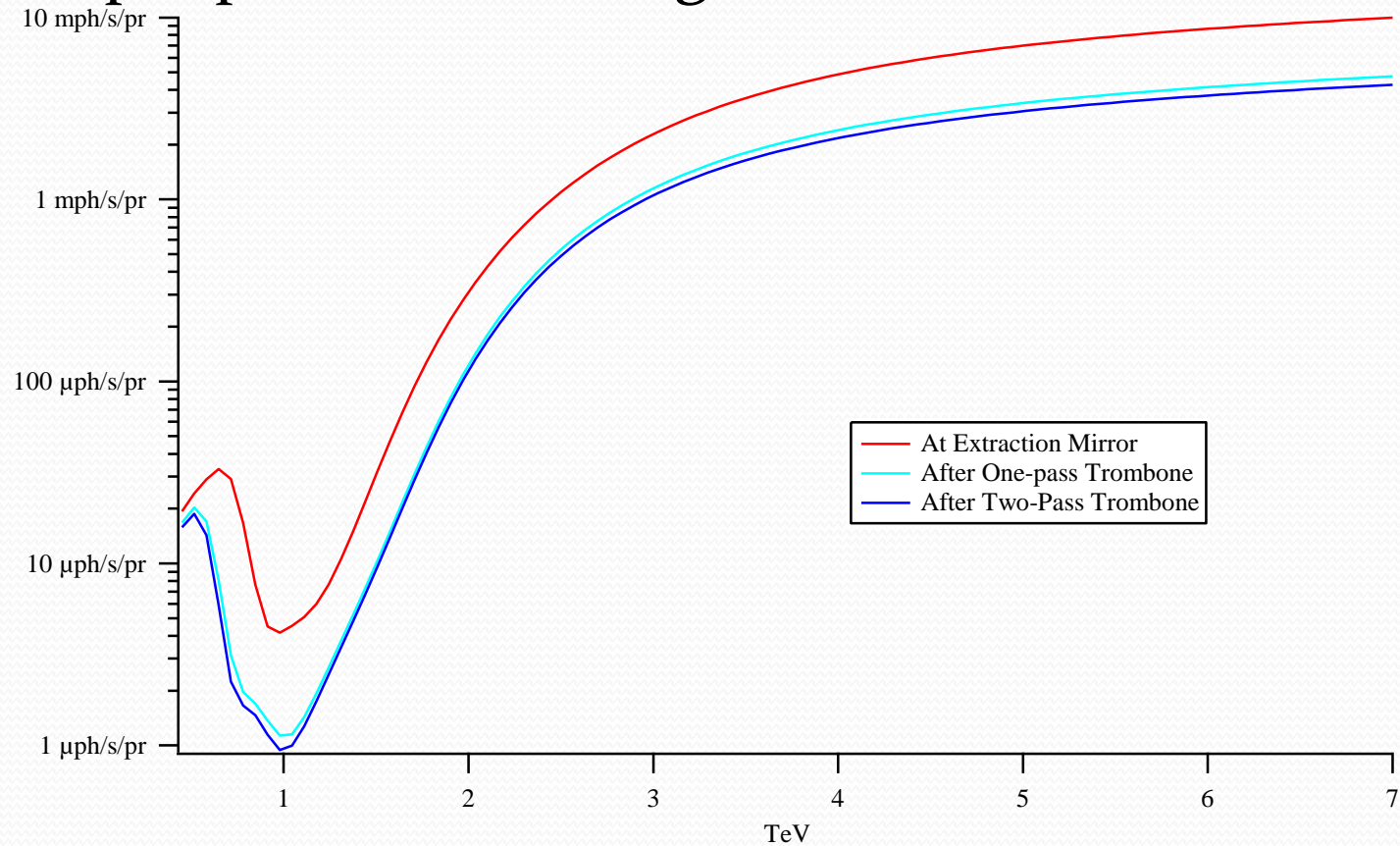
Synchrotron Light for Diagnostics

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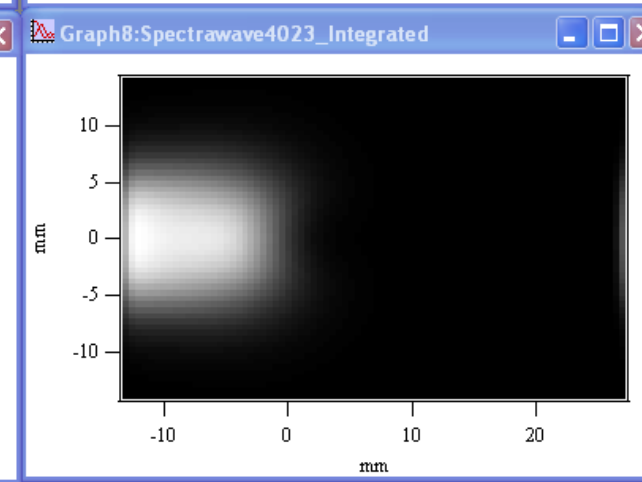
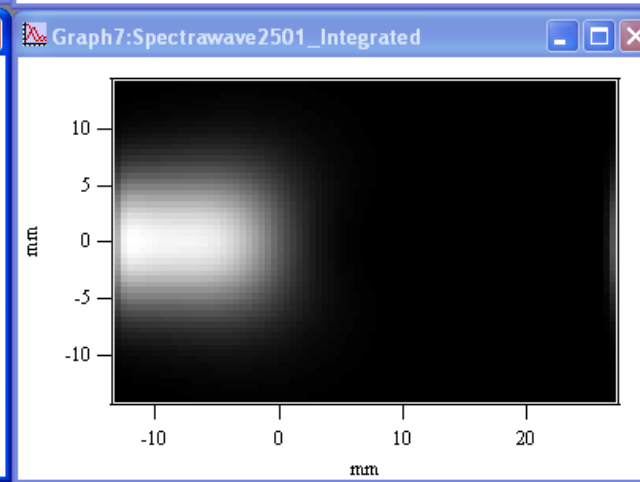
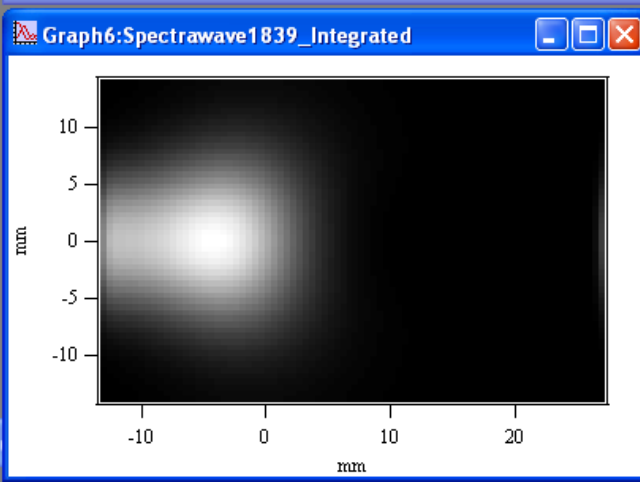
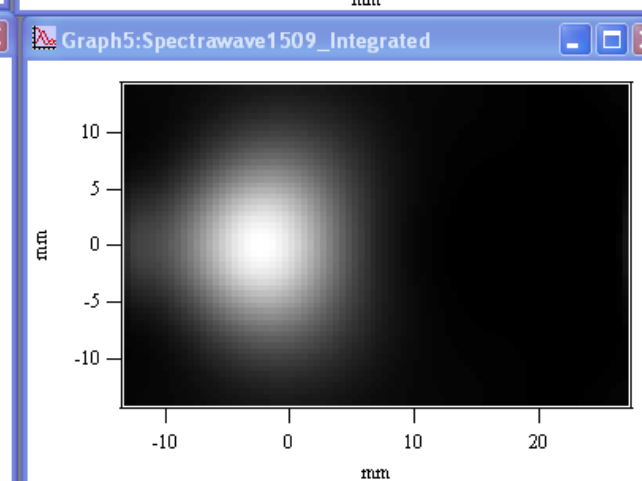
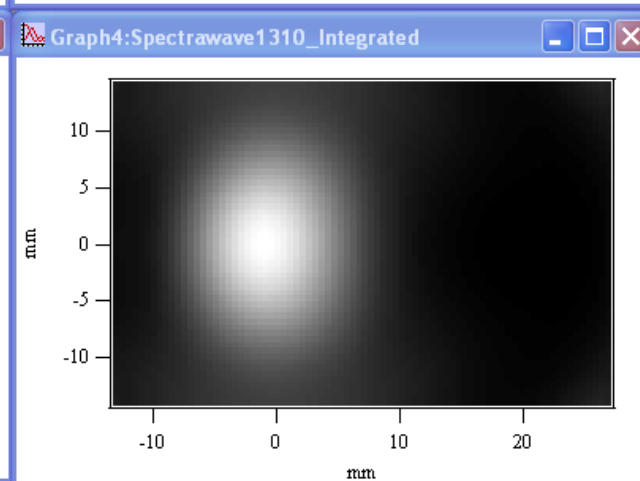
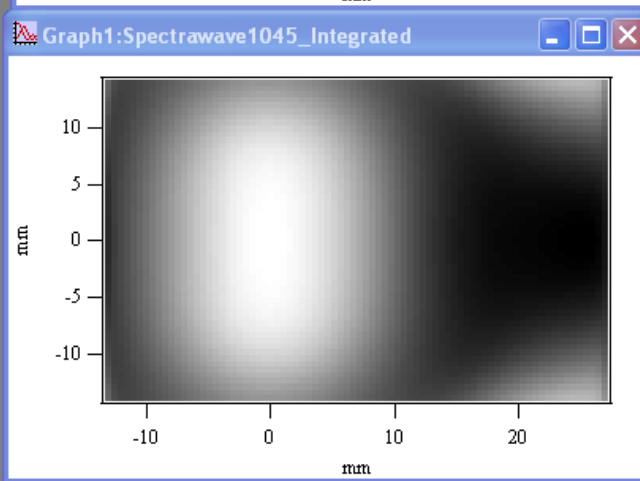
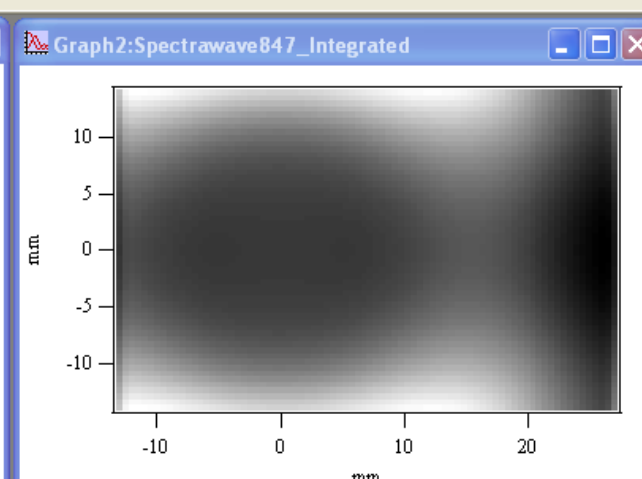
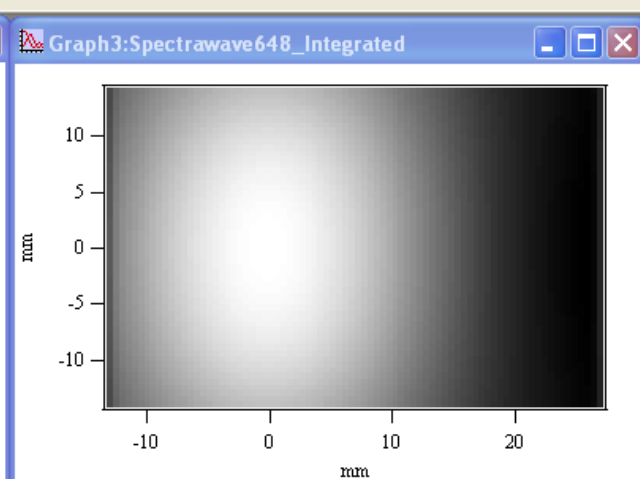
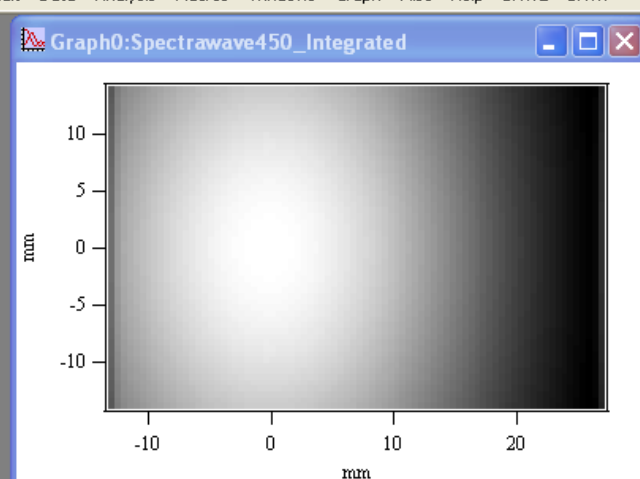
Synchrotron light from protons

- Flux per proton including undulator



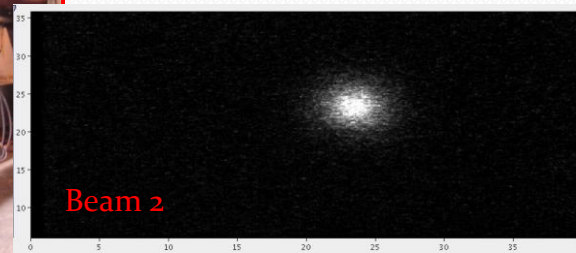
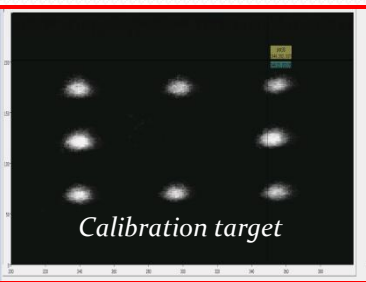
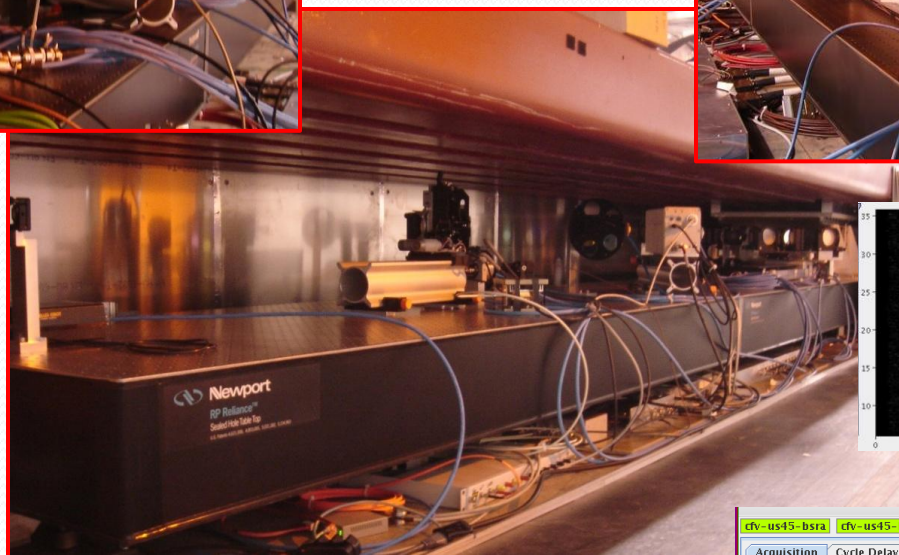
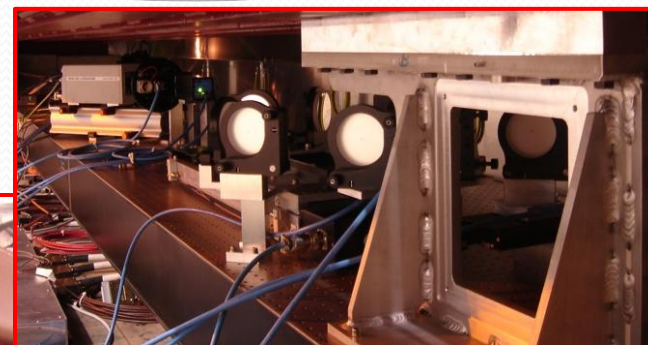


- It takes 30m to separate protons & photons.



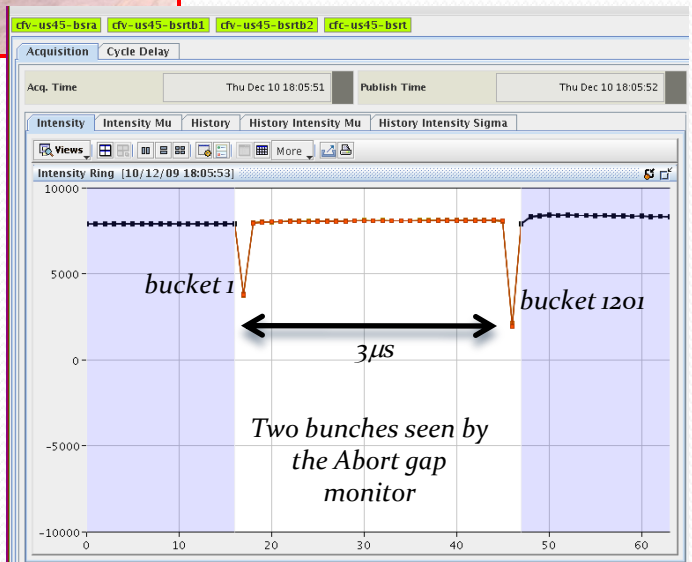


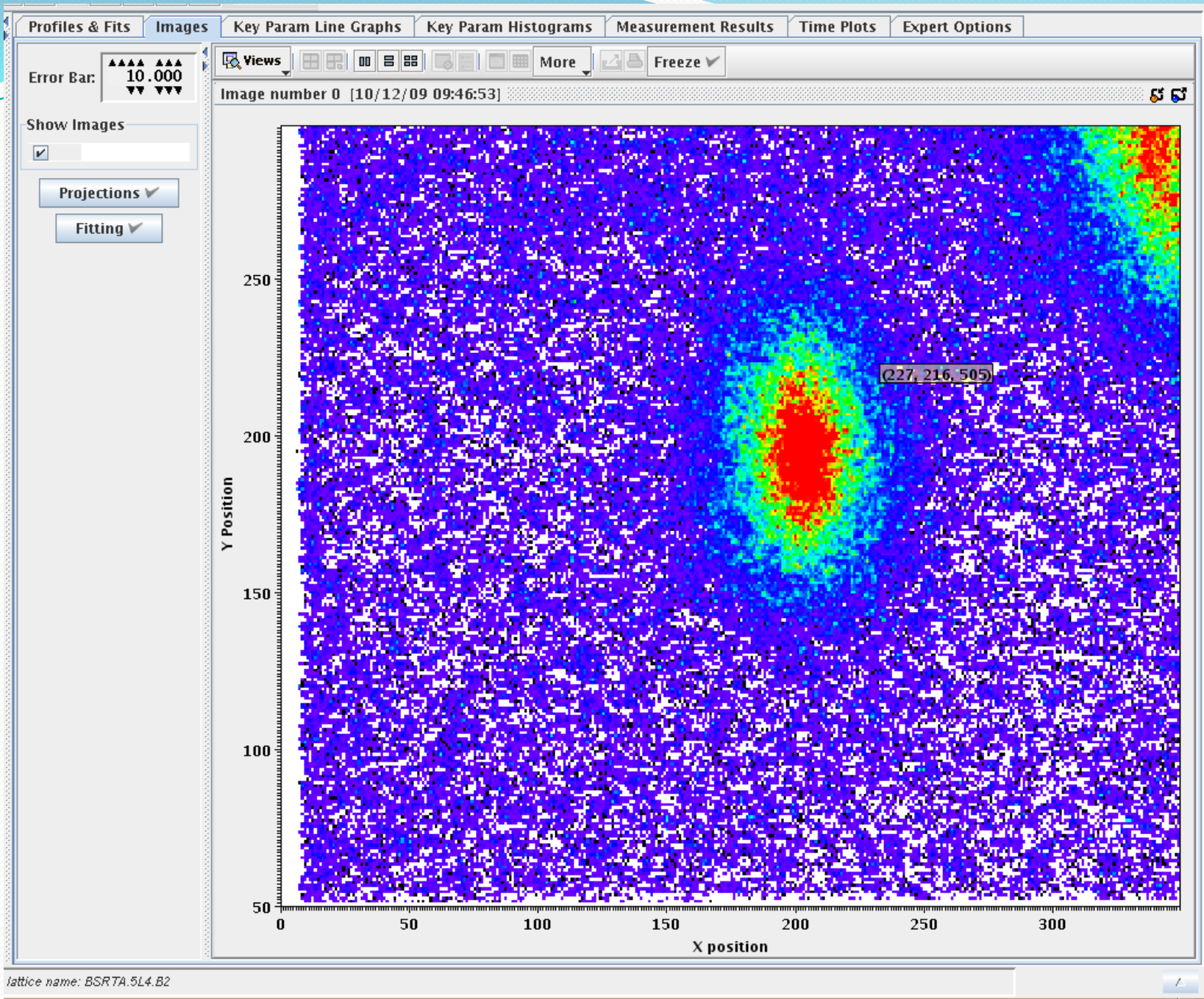
LHC Synchrotron Light Monitors (BSRT) – Run 2009



- New implementations**
- Optical table 4.8m long
 - Calibration line for Cameras and Abort Gap monitor
 - Motorized delay line to follow the SR source from the Undulator to the D3 as the beam energy increases

increases

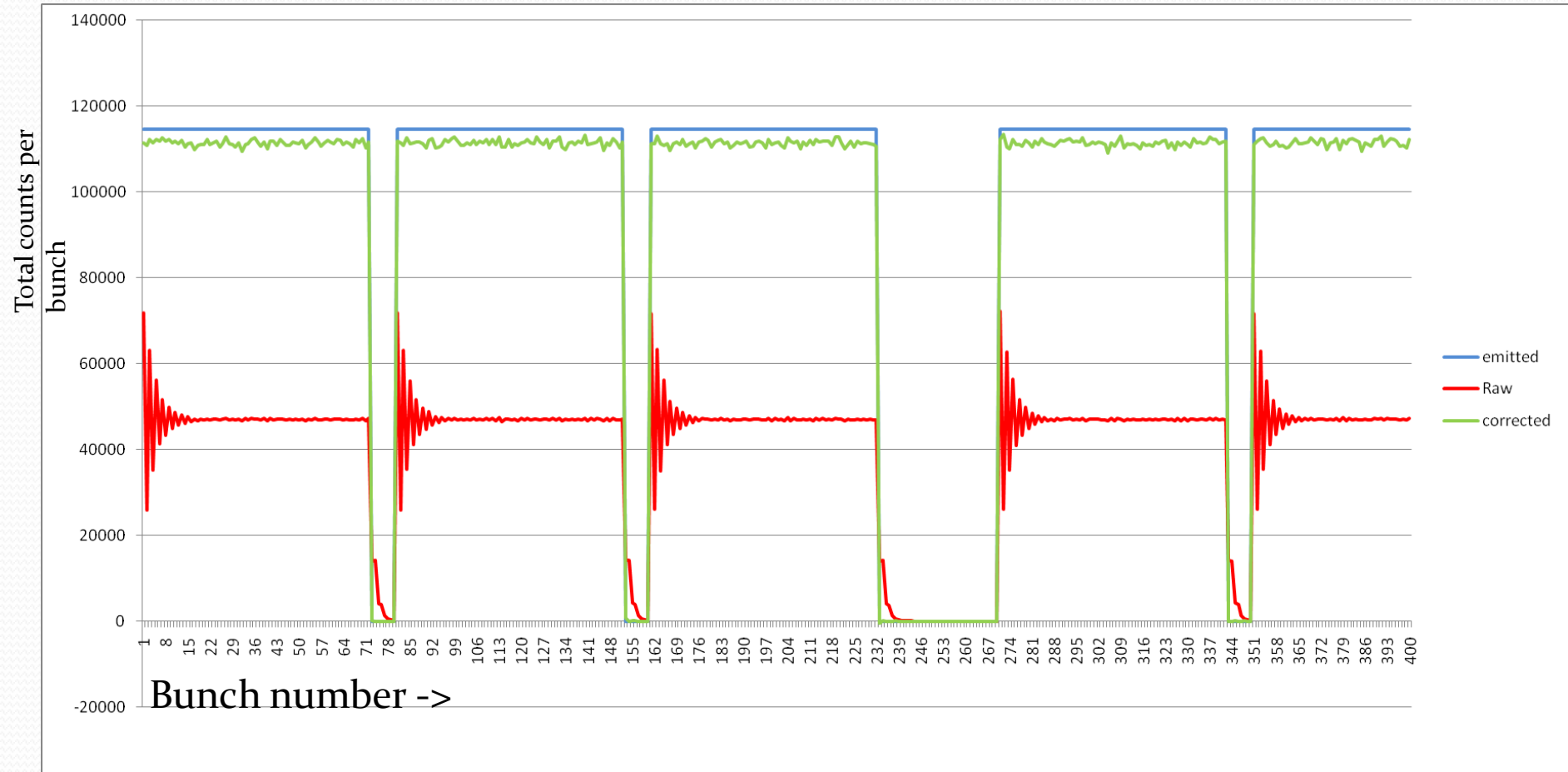




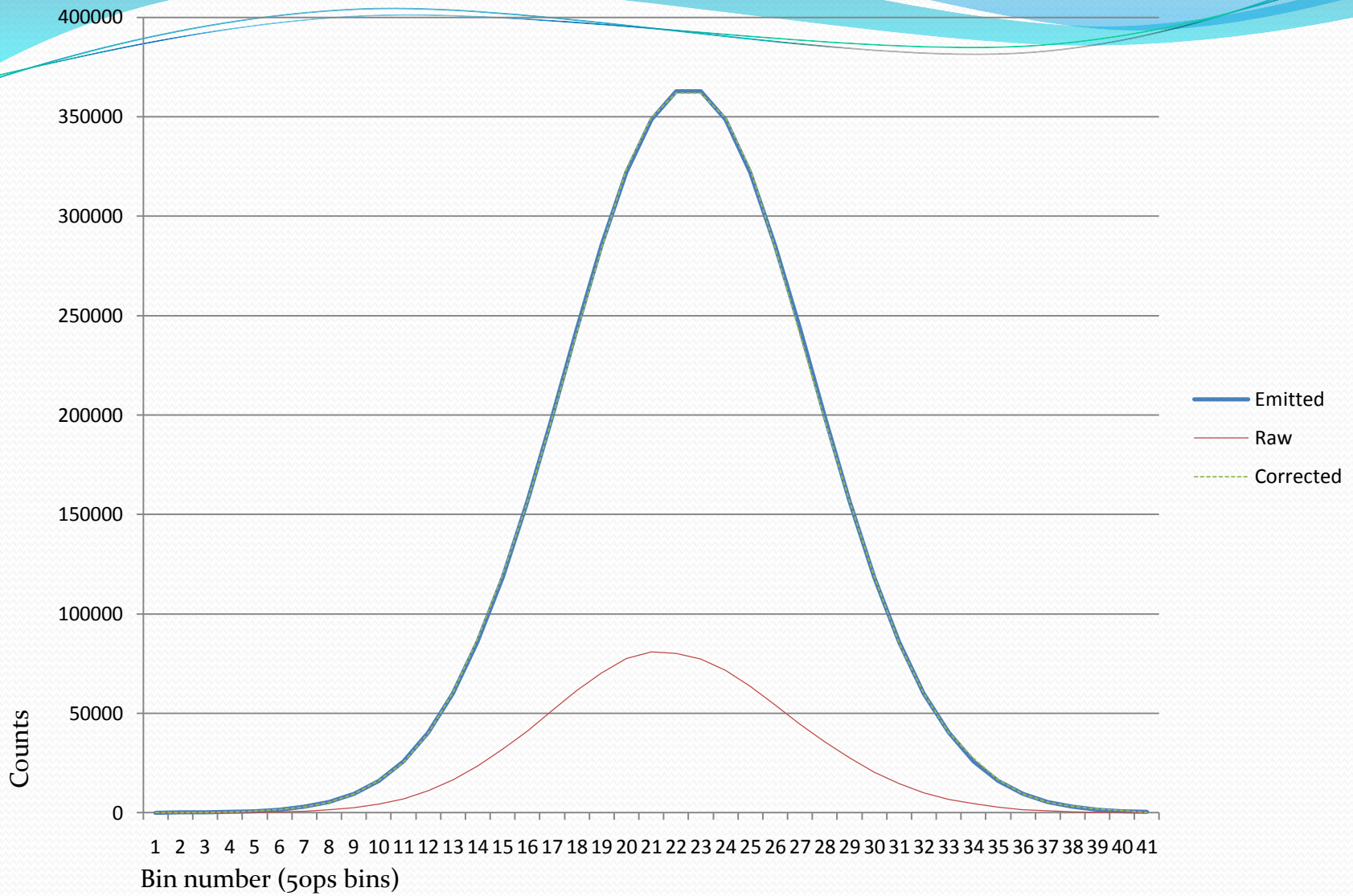
What's needed:

- Photon detector for longitudinal profile.
- Measure proton density as a function of time with 50ps resolution.
- Sensitive to a bunch of 5×10^5 protons, that is 1/300000 of the main bunch
- Measure the bunch parameters (shape, size, density), bunch tails, ghost bunches.

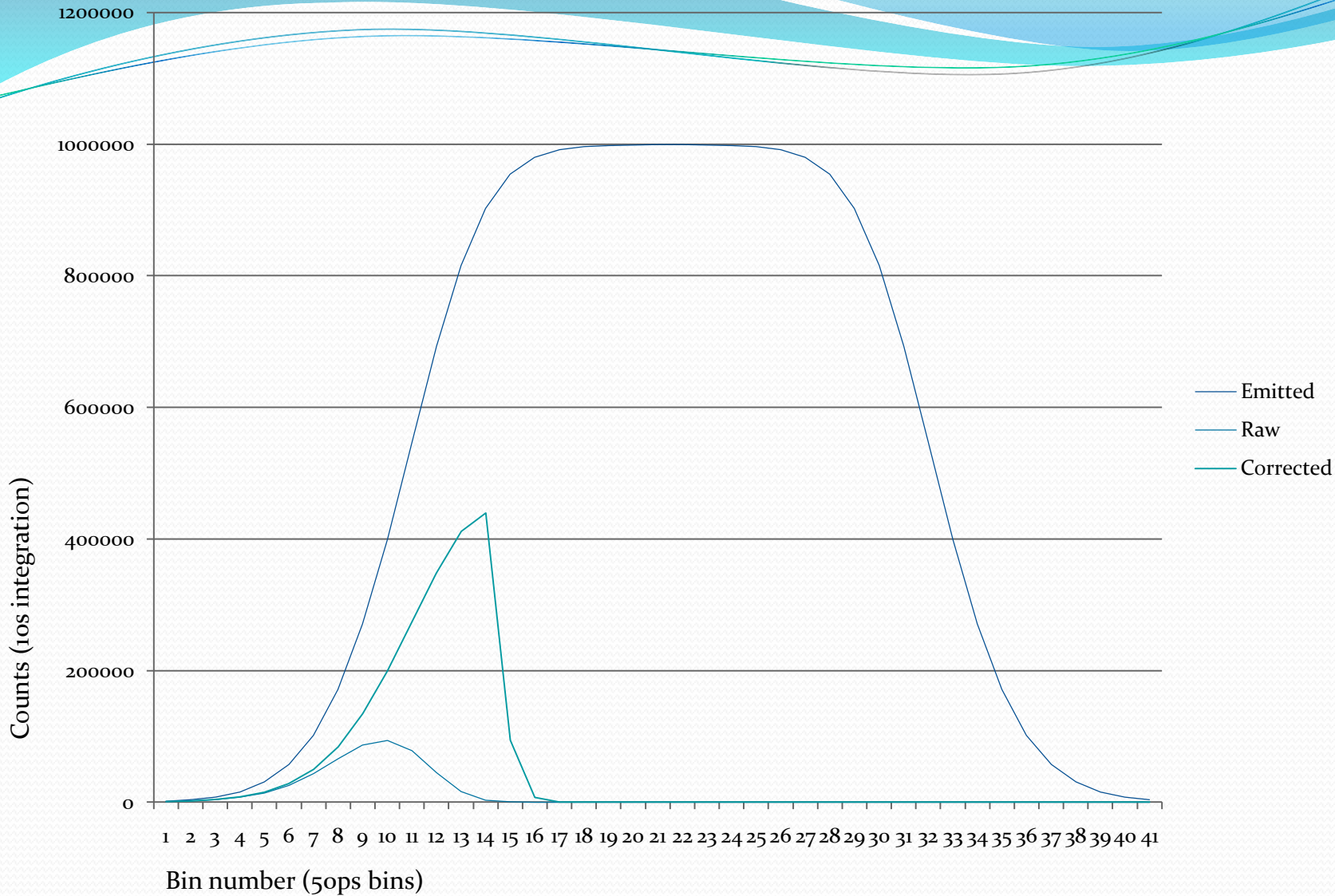
Bunch-by-bunch



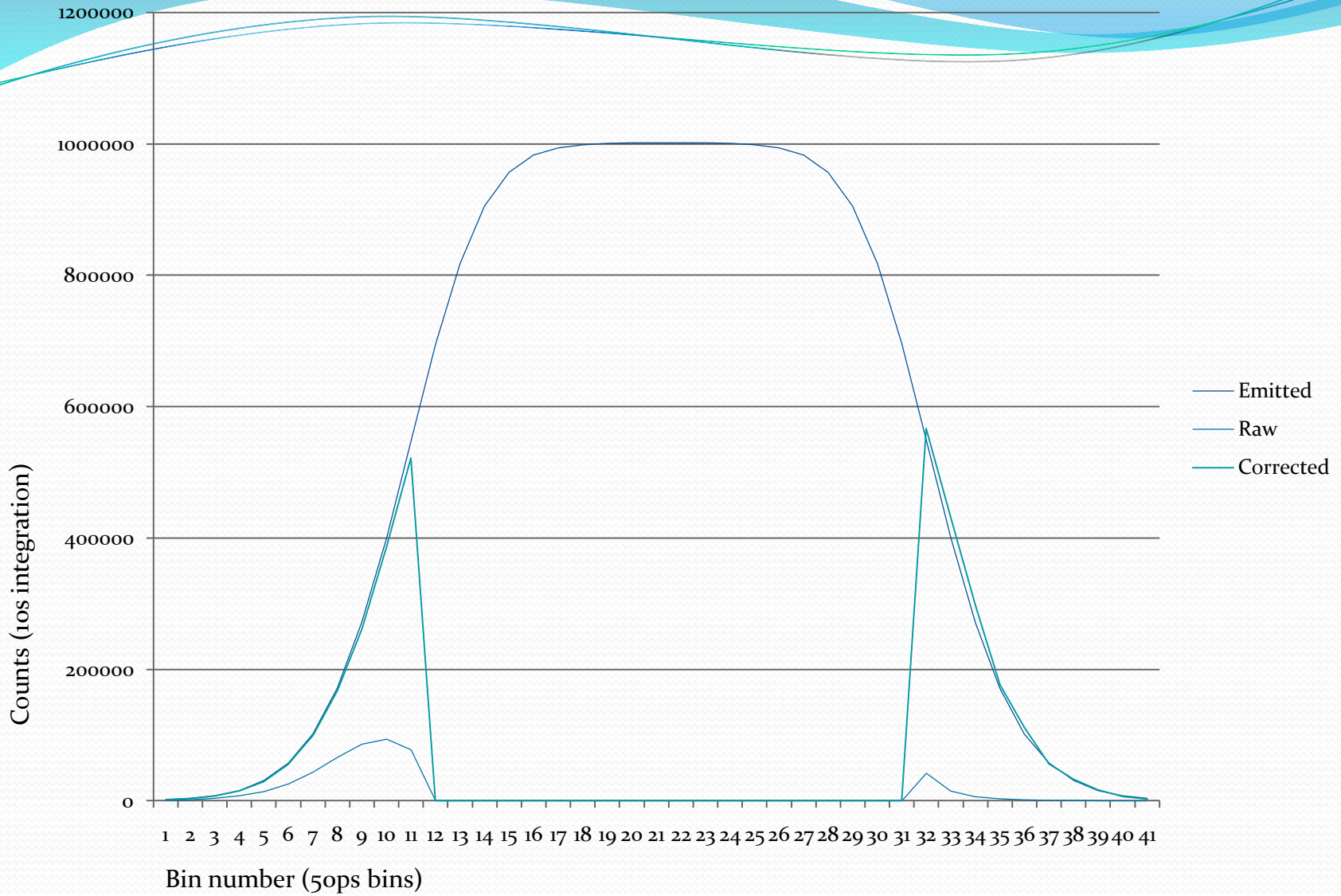
- Bunch current for first few PS batches. Raw counts fluctuate since deadtime $>$ bunch spacing.



- 0.5 photons per bunch, 195ns deadtime



● 90 photons per bunch



- 90 photons per bunch, with gating

The solution

