BPM Calibration Update

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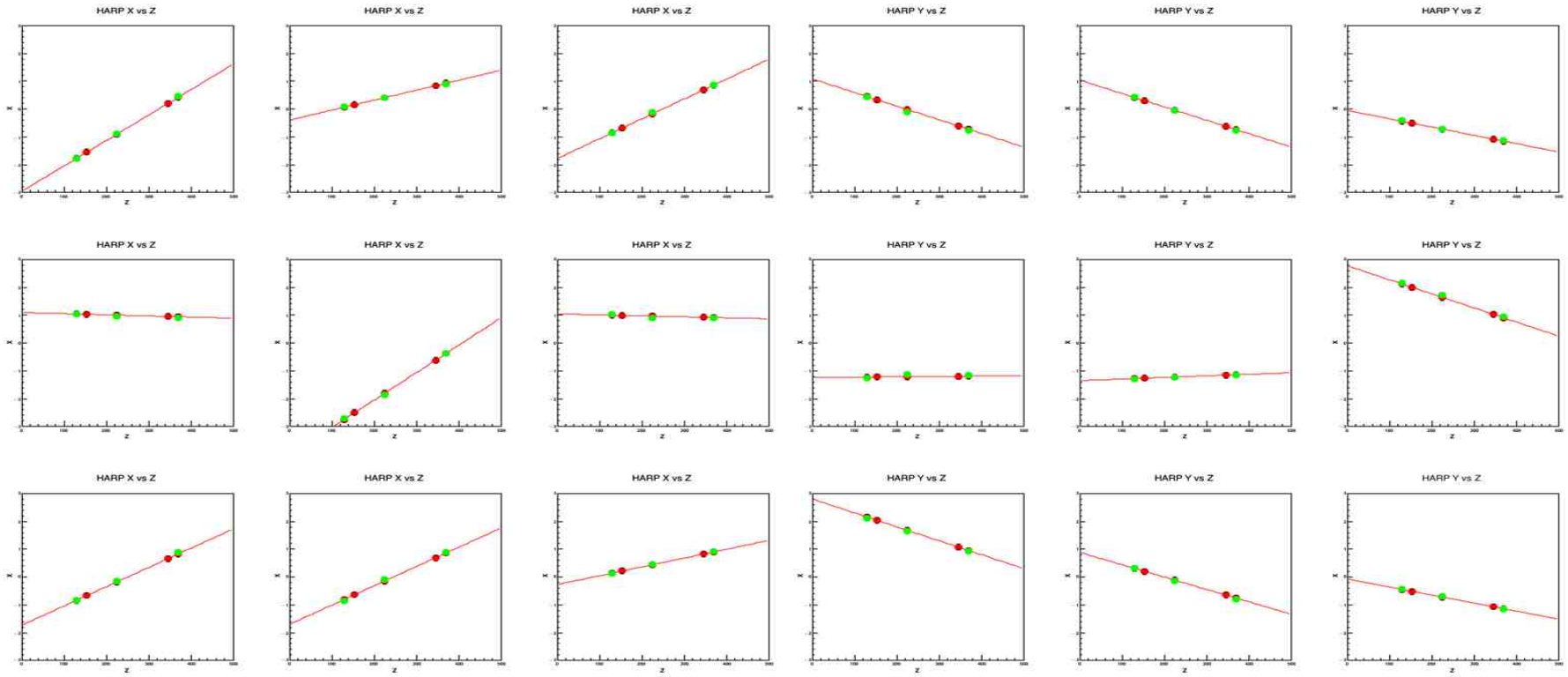
August 9, 2018

Sanity Checks for Internal Consistency



Gains and Offsets

- Projected X/Y Position = slope * Raw EPICS BPM X/Y Position + offset
- A calibration script now exists in

Beam Position at Target (z = 0)

$X(z) = m_x*z + b_x$ and $Y(z) – m_y*z + b_y$

Calculate slopes from A and C BPM's (longest lever arm):

$m_x = (A_x – C_x)/(A_z – C_z)$ and $m_y = (A_y – C_y)/(A_z – C_z)$

Then calculate b_x and b_y (positions at ta[illegible]

EPICS data in detector classes

- The previous algorithm requires the BPM information event by event (as the raster information is event by event).
- Read the calibrated BPM information from (last) EPICS event in the IHcRaster class.
-

THcRaster.h

```
#include "THaEpicsEvtHandler.h"
protected:
        THaEpicsEvtHandler* fEpicsHandler;
```

THcRaster.cxx

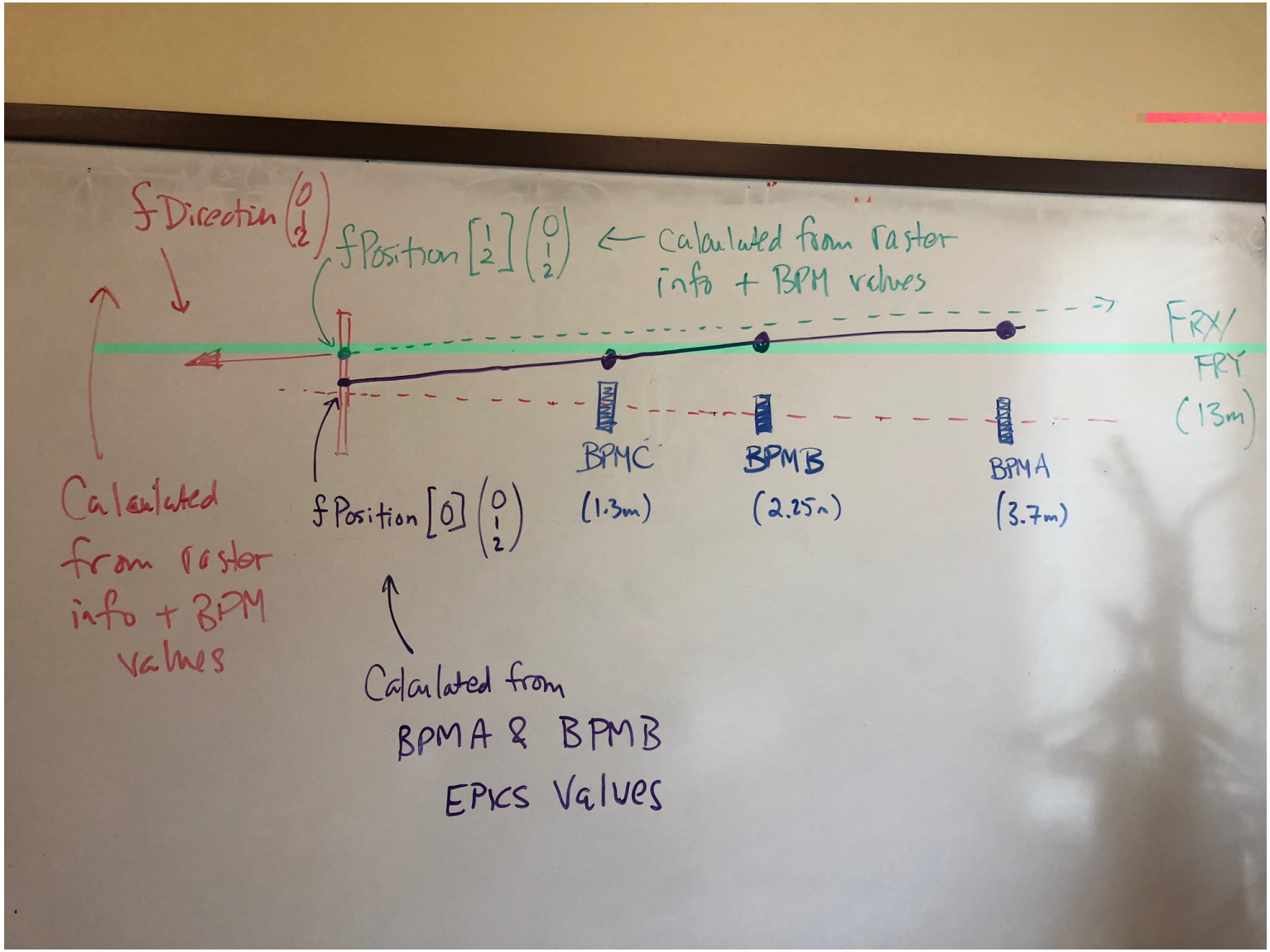
(in somewhere like the ReadDatabase method …)

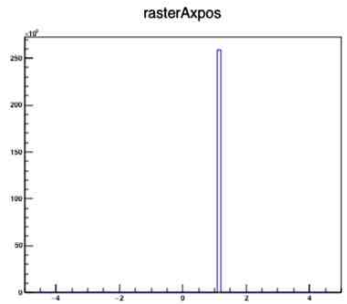
```
        THcAnalyzer *analyzer = dynamic_cast<THcAnalyzer*>(THcAnalyzer::GetInstance());
        fEpicsHandler = analyzer->GetEpicsEvtHandler();
```

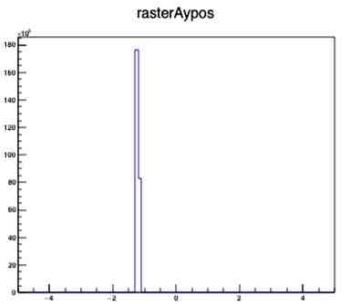
(in the Decode method …)

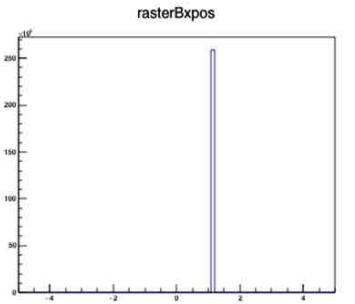
```
        if (fEpicsHandler) {
          if (fEpicsHandler->IsLoaded("IPM3H07A.XRAW")){
                BPMXA_raw = atof(fEpicsHandler->GetString("IPM3H07A.XRAW"));
          }
        }
```

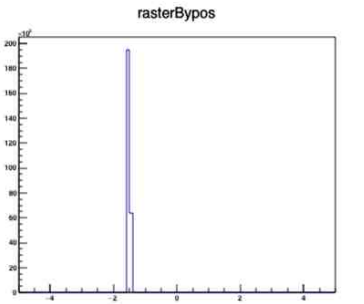
N.B. Need to be careful with units!!! BPM calibrations are in mm, raster is in cm currently!!

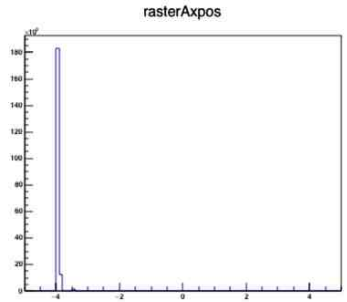

fDirection (0 1 2)
fPosition [1 2] (0 1 2) ← Calculated from raster info + BPM values
FRX/FRY (13m)
BPMC (1.3m)
BPMB (2.25m)
BPMA (3.7m)
Calculated from raster info + BPM values
fPosition [0] (0 1 2)
Calculated from BPMA & BPMB EPICS Values

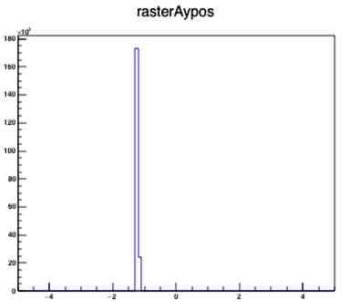

rasterAxpos


rasterAypos


rasterBxpos


rasterBypos


rasterAxpos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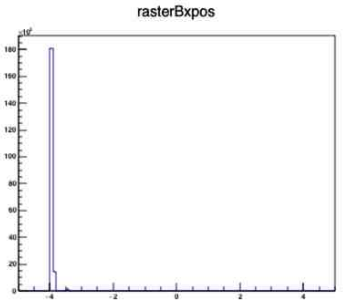
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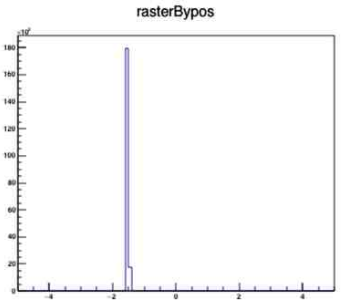
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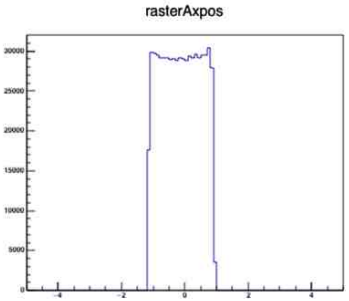
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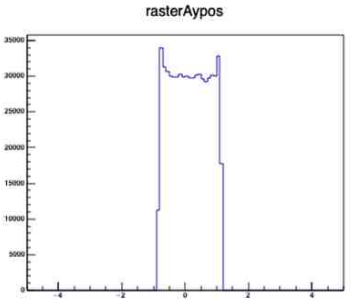
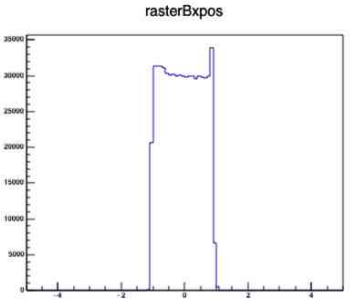
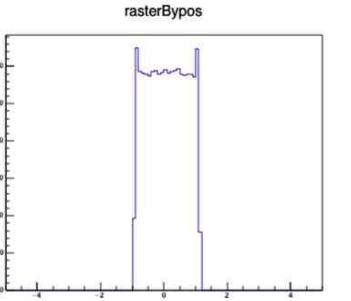

rasterAypos


rasterBxpos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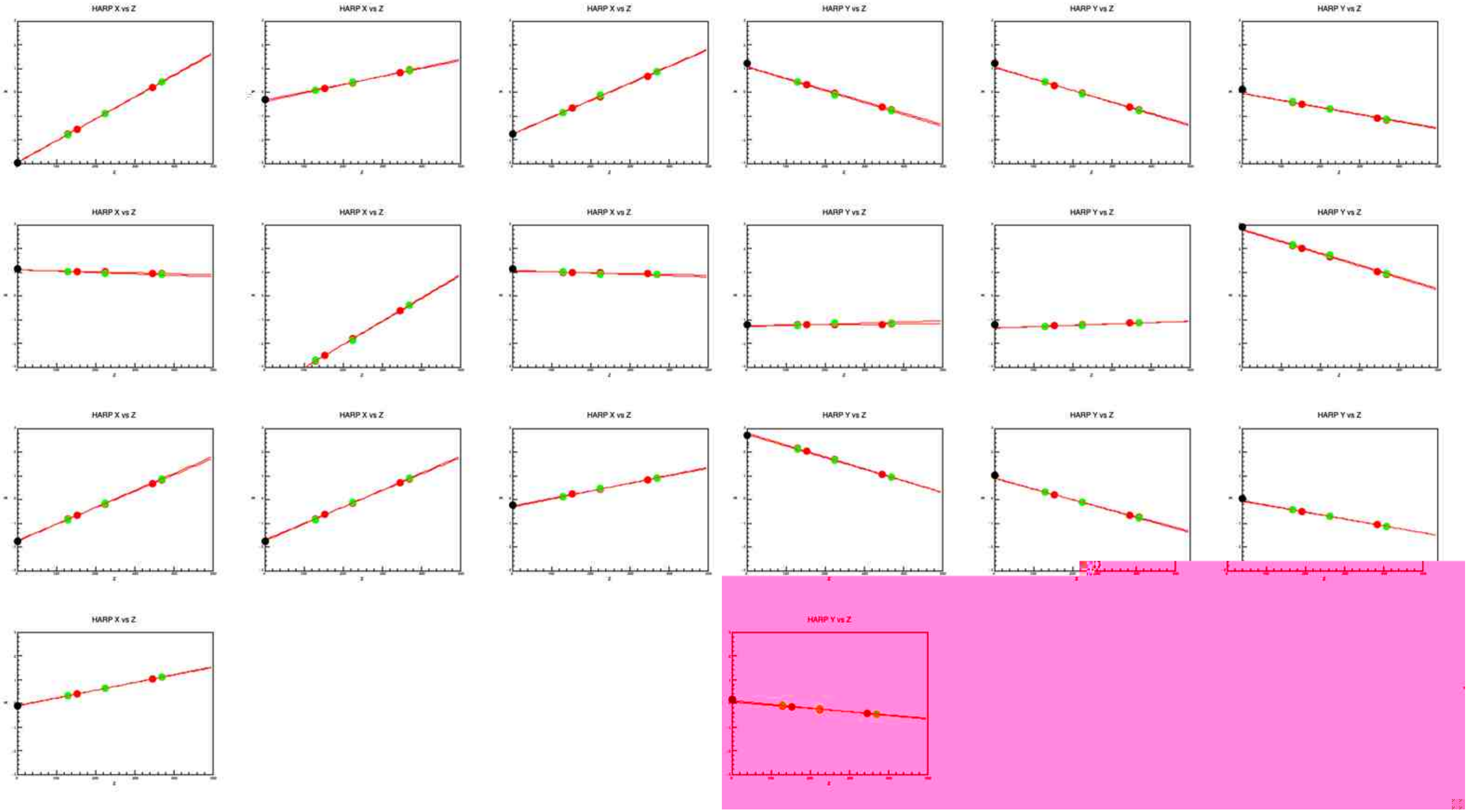
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