Pixel Run Control and Calibration

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Done

- PixelSupervisorGUI if run in "Test" mode asks for three files to feed the test DAC of the FED with before pressing the "Start" button. These three files are human readable and have the following format:

  <div align="center">

  TBMHeader (*TBM Event #*)

  ROCHeader (*Last DAC Value*)

  PixelHit (*column, row, charge deposit*)

  PixelHit (40, 20, 200)

  ROCHeader (5)

  PixelHit (20, 11, 350)

  .

  .

  TBMTrailer (*TBM Trailer*)

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- A parser to convert such a file to a pulse train was implemented in pixel/PixelUtilities/PixelFEDDataTools/include/TestDACTools.h and is used by PixelFEDSupervisor.

- Tested it on Vanderbilt's FED. The correspondence between the DAC and ADC values were inspected. They have almost the same slopes, but different offsets (especially channel 33 which throws the pixel row and column terribly off). Also, the beginning ROC # for different channels appears to vary between 2 and 3! Why is this?

To Do

Threshold Level Calibration

- Get an accurate picture of the DAC-ADC correspondence curve for each channel. That means feeding the test-DAC a pulse train and reading FIFO 1 in transparent mode.

- Based on these curves, settle on reasonable levels for UB, B, 0, 1… etc for entering a pulse train into the test-DAC. The pulse train may actually correspond to a pixel hit.

- Take this pulse train and "blur" each pulse (with a Gaussian blur with controlled standard deviation) to simulate noise.

- Take the output of the blurring process and feed it to the test DAC.

- See the mean and spread of each of the levels as it comes out through FIFO 1. Set the threshold levels accordingly for each channel.