Status of the Raw Data Decoder in parts of Silicon, GEM and CSC digits

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Main task

Embed MK decoding algorithm for strip detectors:

- GEM
- CSC (Treated as a last station of GEM)
- Silicons

Decoding algorithms

MK

- Pedestal gathering (100k any type)
- Recalculate pedestals:
  2 staged filterings of CMS based on narrowing sequence of fixed thresholds
- Mark noisy channels based on pedestal RMS deviations
- Cycle:
  - staged filtering of EventCMS based on narrowing sequence of fixed thresholds
  - Signal > threshold
- Mark noisy channels based on profile deviations
- Save noisy channels to file
- Repeat all again using marked noisy

SM

- Pedestal gathering (500 pedestals)
- Fill profiles on the basis of part of data
- Mark noisy channels based on profile deviations
- Cycle:
  - Decode part of the data until enough new pedestals (500) arrive:
  - staged filtering of EventCMS based on RMS
  - Signal > threshold
  - Recalculate pedestals:
    staged filtering of CMS based on RMS

Silicon

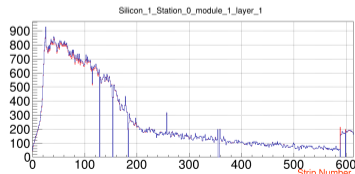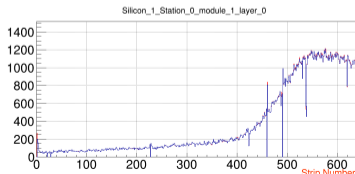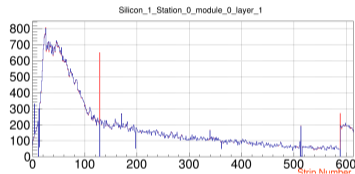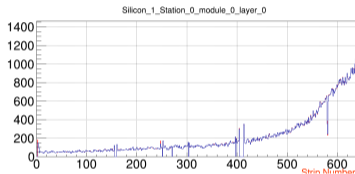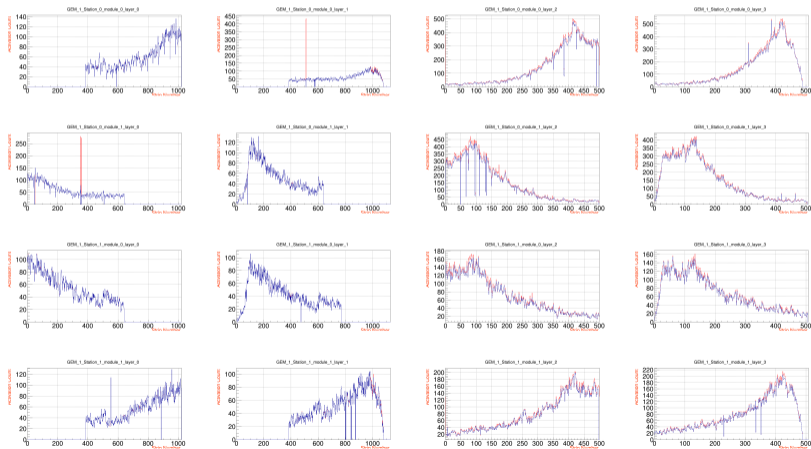Figure: Red - MK code, Blue - MK macro

GEM

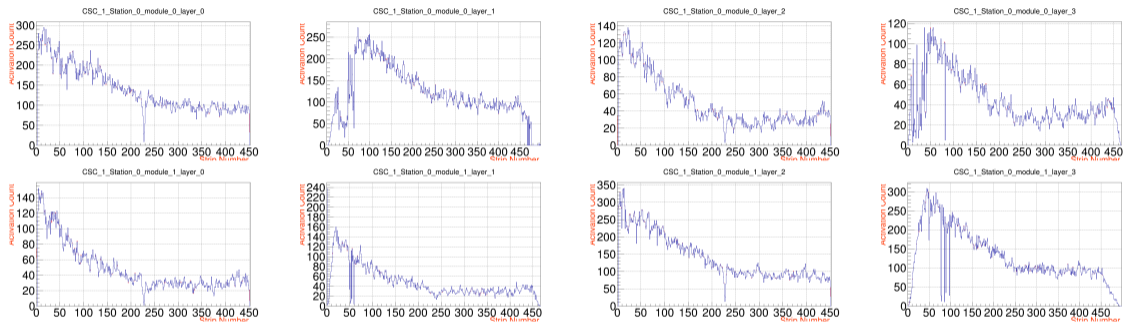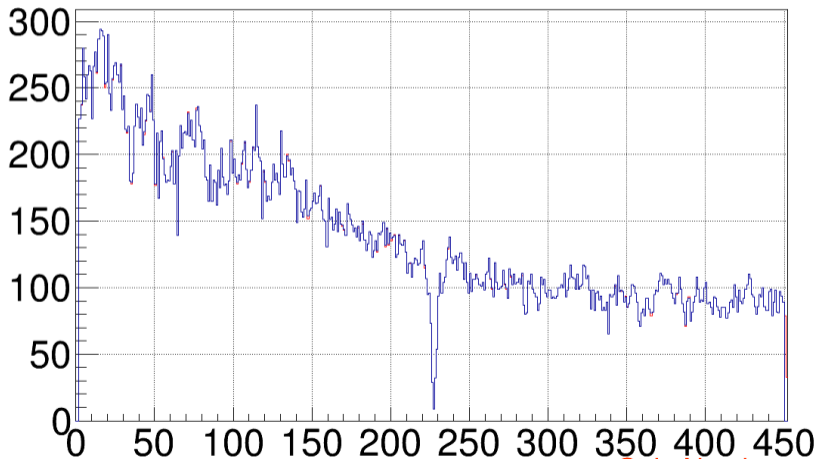Figure: Red - MK code, Blue - MK macro

CSC

Figure: Red - MK code, Blue - MK macro

CSC

Figure: Red - MK code, Blue - MK macro

Mode selection

BmnDataToRoot.C:

$decoder->SetAdcDecoMode(kBMNADCMK);$

or in bmnconf.json:
```
{
    "Decoder": {
        "AdcDecoMode": "MK",
        "DigiTreeName": "bmndata",
        "DigiTreeTitle": "bmndigit"
    }
}
```

Future work

Future Development:

- Make support of period 6
- Combine best elements of algorithms and implant to BmnAdcProcessor - base class of
  - BmnGemRaw2Digit
  - BmnCSCRaw2Digit
  - BmnSiliconRaw2Digit