Digitizer: round

```
[dune925]/home/yuhw/wc/larsoft925/src/pr-175
$git diff
diff --git a/gen/src/Digitizer.cxx b/gen/src/Digitizer.cxx
index 52c3d86..04f2144 100644
--- a/gen/src/Digitizer.cxx
+++ b/gen/src/Digitizer.cxx
@@ -91,7 +91,8 @@ double Gen::Digitizer::digitize(double voltage)
         return adcmaxval;
     }
     const double relvoltage = (voltage - m_fullscale[0]) / (m_fullscale[1] - m_fullscale[0]);
-    return round(relvoltage * adcmaxval);
+    //return round(relvoltage * adcmaxval);
+    return relvoltage * adcmaxval;
 }

 bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adcframe)
[dune925]/home/yuhw/wc/larsoft925/src/pr-175
$git status
On branch img-gnn
Your branch is up to date with 'origin/img-gnn'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   gen/src/Digitizer.cxx

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        configure

no changes added to commit (use "git add" and/or "git commit -a")
```
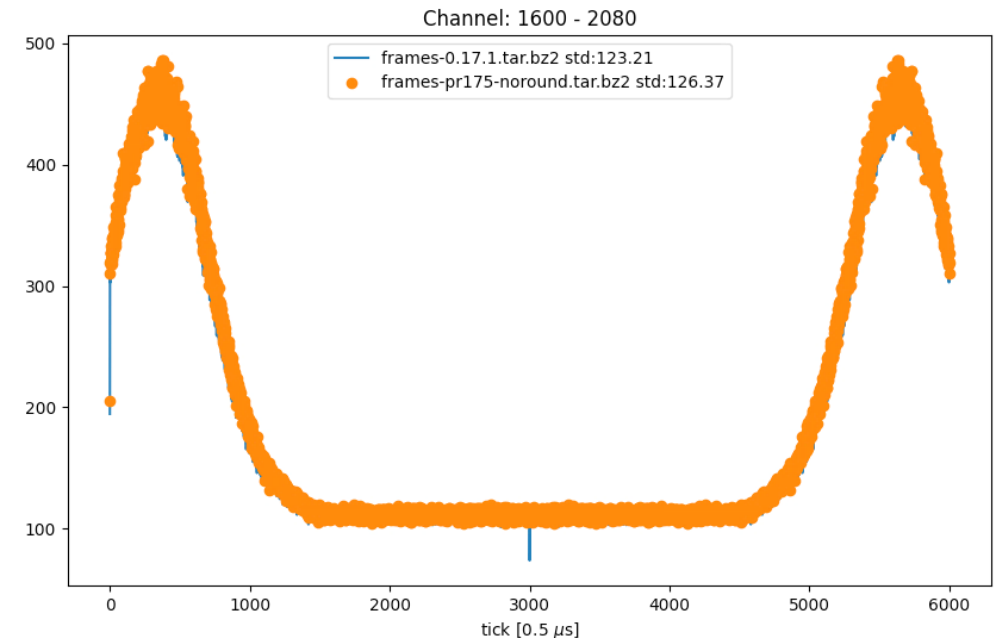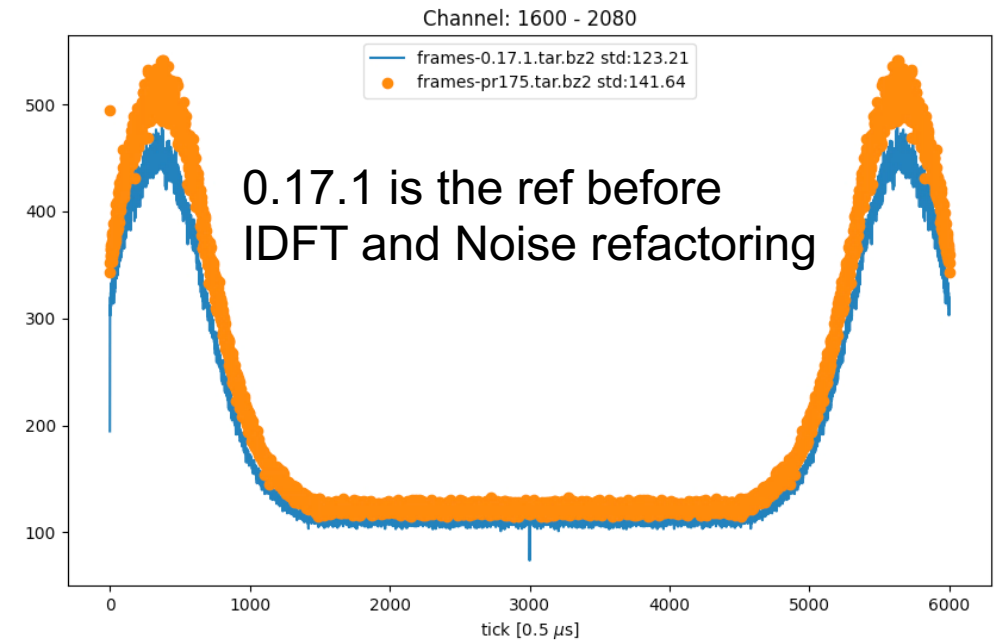

Channel: 1600 - 2080
— frames-0.17.1.tar.bz2 std:123.21
• frames-pr175.tar.bz2 std:141.64

0.17.1 is the ref before IDFT and Noise refactoring

Channel: 1600 - 2080
— frames-0.17.1.tar.bz2 std:123.21
• frames-pr175-noround.tar.bz2 std:126.37

Brookhaven National Laboratory

1

log


```
129 [20:20:43.478] D [ pgraph ] executing with 12 nodes
130 [20:20:43.478] D [  gen   ] <TrackDepos:trackdepos> EOS at call 0
131 [20:20:43.478] D [  gen   ] <Drifter:> xregion: anode: -3578.36 mm, response: -3487.8875 mm, cathode: -1.587500000000091 mm,
132 [20:20:43.478] D [  gen   ] <Drifter:> xregion: anode: -3683.14 mm, response: -3773.6125 mm, cathode: -7259.9125 mm, flushing
133 [20:20:43.478] D [  gen   ] <Drifter:> xregion: anode: 3683.14 mm, response: 3773.6125 mm, cathode: 7259.9125 mm, flushing 0
134 [20:20:43.478] D [  gen   ] <Drifter:> xregion: anode: 3578.36 mm, response: 3487.8875 mm, cathode: 1.587500000000091 mm, flu
135 [20:20:43.478] D [  gen   ] <DepoBagger:bagger> send bag #0 with 0 depos followed by EOS
136 [20:20:43.478] D [  glue  ] <DepoSetFanout:sn_mag_nf> call=0 fanout depo set 0 with 0
137 [20:20:43.683] D [  gen   ] <DepoTransform:depotransform-apa0> call=0 frame=100 ndepos_in=0 ndepos_used=0 ntraces=0
138 [20:20:43.709] D [  gen   ] <Reframer:reframer-apa0> call=0 frame=100 all traces in: 0 out tag: ""
139 [20:20:43.709] W [  gen   ] <IncoherentAddNoise:addnoise-empericalnoise-apa0> model EmpiricalNoiseModel:empericalnoise-apa0 p
140 [20:20:43.938] D [  gen   ] <IncoherentAddNoise:addnoise-empericalnoise-apa0> call=0 frame=100 2560 traces
141 [20:20:44.386] D [  gen   ] <Digitizer:digitizer-apa0> call=0 traces=2560 frame=100 totadc=27744623071 outtag="orig0"
142 [20:20:44.388] D [magnify ] MagnifySink: opening for output: frames-pr175.root with mode UPDATE
143 [20:20:44.391] D [magnify ] MagnifySink: set desired trace tag to "" as cfg::trace_has_tag=false
144 [20:20:44.391] D [magnify ] MagnifySink: tag: "orig0" with 2560 traces
145 [20:20:44.391] D [magnify ] MagnifySink: cbin:800[-0.5,799.5] tbin:6000[0,6000]
146 [20:20:44.471] D [magnify ] MagnifySink: cbin:800[799.5,1599.5] tbin:6000[0,6000]
147 [20:20:44.552] D [magnify ] MagnifySink: cbin:960[1599.5,2559.5] tbin:6000[0,6000]
148 [20:20:45.429] D [magnify ] MagnifySink: closing output file frames-pr175.root, wrote 18695579 bytes
149 [20:20:45.433] D [  glue  ] <FrameFanin:sn_mag_nf> call=0 input 0: frame 100 with 2560 traces tagged:[ orig0 ] 0 traces:[ ] o
150 Retagger: tagging trace set: daq with 2560 traces, 0 summary
151 [20:20:45.434] D [   io   ] <FrameFileSink:> call=0 frame=100 ntraces=2560 tag="orig"
152 [20:20:49.665] D [  glue  ] <DepoSetFanout:sn_mag_nf> EOS at call=1
153 [20:20:49.665] D [  gen   ] <DepoTransform:depotransform-apa0> EOS at call=1
pr175.log
129 [20:28:04.815] D [ pgraph ] executing with 12 nodes
130 [20:28:04.815] D [  gen   ] <TrackDepos:trackdepos> EOS at call 0
131 [20:28:04.815] D [  gen   ] <Drifter:> xregion: anode: -3578.36 mm, response: -3487.8875 mm, cathode: -1.587500000000091 mm,
132 [20:28:04.815] D [  gen   ] <Drifter:> xregion: anode: -3683.14 mm, response: -3773.6125 mm, cathode: -7259.9125 mm, flushing
133 [20:28:04.815] D [  gen   ] <Drifter:> xregion: anode: 3683.14 mm, response: 3773.6125 mm, cathode: 7259.9125 mm, flushing 0
134 [20:28:04.815] D [  gen   ] <Drifter:> xregion: anode: 3578.36 mm, response: 3487.8875 mm, cathode: 1.587500000000091 mm, flu
135 [20:28:04.815] D [  gen   ] <DepoBagger:bagger> send bag #0 with 0 depos followed by EOS
136 [20:28:04.815] D [  glue  ] <DepoSetFanout:sn_mag_nf> call=0 fanout depo set 0 with 0
137 [20:28:05.045] D [  gen   ] <DepoTransform:depotransform-apa0> call=0 frame=100 ndepos_in=0 ndepos_used=0 ntraces=0
138 [20:28:05.077] D [  gen   ] <Reframer:reframer-apa0> call=0 frame=100 all traces in: 0 out tag: ""
139 [20:28:05.078] W [  gen   ] <IncoherentAddNoise:addnoise-empericalnoise-apa0> model EmpiricalNoiseModel:empericalnoise-apa0 p
140 [20:28:05.322] D [  gen   ] <IncoherentAddNoise:addnoise-empericalnoise-apa0> call=0 frame=100 2560 traces
141 [20:28:05.632] D [  gen   ] <Digitizer:digitizer-apa0> call=0 traces=2560 frame=100 totadc=27744624301.767456 outtag="orig0"
142 [20:28:05.634] D [magnify ] MagnifySink: opening for output: frames-pr175-noround.root with mode UPDATE
143 [20:28:05.636] D [magnify ] MagnifySink: set desired trace tag to "" as cfg::trace_has_tag=false
144 [20:28:05.636] D [magnify ] MagnifySink: tag: "orig0" with 2560 traces
145 [20:28:05.637] D [magnify ] MagnifySink: cbin:800[-0.5,799.5] tbin:6000[0,6000]
146 [20:28:05.717] D [magnify ] MagnifySink: cbin:800[799.5,1599.5] tbin:6000[0,6000]
147 [20:28:05.797] D [magnify ] MagnifySink: cbin:960[1599.5,2559.5] tbin:6000[0,6000]
148 [20:28:07.053] D [magnify ] MagnifySink: closing output file frames-pr175-noround.root, wrote 43231109 bytes
149 [20:28:07.058] D [  glue  ] <FrameFanin:sn_mag_nf> call=0 input 0: frame 100 with 2560 traces tagged:[ orig0 ] 0 traces:[ ] o
150 Retagger: tagging trace set: daq with 2560 traces, 0 summary
151 [20:28:07.058] D [   io   ] <FrameFileSink:> call=0 frame=100 ntraces=2560 tag="orig"
152 [20:28:11.451] D [  glue  ] <DepoSetFanout:sn_mag_nf> EOS at call=1
153 [20:28:11.451] D [  gen   ] <DepoTransform:depotransform-apa0> EOS at call=1
pr175-noround.log
```

Brookhaven
National Laboratory

digiti

gen/src

Digitizer.cxx

9 ▪▪▪▪▪▪ gen/src/Digitizer.cxx

No hover information available.

Go to definition | Find references

```
@@ -91,7 +91,7 @@ double Gen::Digitizer::digitize(double voltage)
 91              return adcmaxval;                                           91              return adcmaxval;
 92          }                                                               92          }
 93          const double relvoltage = (voltage - m_fullscale[0]) / (m_fullscale[1] - m_fullscale[0]);   93  +      const double relvoltage = (voltage - m_fullscale[0]) / (m_fullscale[1] - m_fullscale[0]);
 94  -       return relvoltage * adcmaxval;                                  94  +       return round(relvoltage * adcmaxval);
 95      }                                                                   95      }
 96                                                                          96
 97  bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adcframe)   97  bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adcframe)
```

```
@@ -129,6 +129,8 @@ bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adc
129                                                                         129
130          ITrace::vector adctraces(nrows);                               130          ITrace::vector adctraces(nrows);
131                                                                         131
                                                                           132  +      double totadc = 0;
                                                                           133  +
132          for (size_t irow = 0; irow < nrows; ++irow) {                 134          for (size_t irow = 0; irow < nrows; ++irow) {
133              int ch = channels[irow];                                  135              int ch = channels[irow];
134              WirePlaneId wpid = m_anode->resolve(ch);                  136              WirePlaneId wpid = m_anode->resolve(ch);
```

```
@@ -143,6 +145,7 @@ bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adc
143                  double voltage = m_gain * arr(irow, icol) + baseline;   145                  double voltage = m_gain * arr(irow, icol) + baseline;
144                  const float adcf = digitize(voltage);                 146                  const float adcf = digitize(voltage);
145                  adcwave[icol] = adcf;                                 147                  adcwave[icol] = adcf;
                                                                           148  +              totadc += adcf;
146              }                                                         149              }
147              adctraces[irow] = make_shared<SimpleTrace>(ch, tbinmm.first, adcwave);   150              adctraces[irow] = make_shared<SimpleTrace>(ch, tbinmm.first, adcwave);
148          }                                                             151          }
```

```
@@ -152,9 +155,9 @@ bool Gen::Digitizer::operator()(const input_pointer& vframe, output_pointer& adc
152      }                                                                 155      }
153      adcframe = sframe;                                                156      adcframe = sframe;
154                                                                        157
155  -   log->debug("call={} traces={} frame={} outtag=\"{}\"",           158  +   log->debug("call={} traces={} frame={} totadc={} outtag=\"{}\"",
156              m_count,                                                  159              m_count,
157  -           adctraces.size(), vframe->ident(), m_frame_tag);          160  +           adctraces.size(), vframe->ident(), totadc, m_frame_tag);
158      ++m_count;                                                        161      ++m_count;
159      return true;                                                      162      return true;
160  }                                                                     163  }
```

Brookhaven National Laboratory

3