Readout Performance Research

Monday, December 7, 2020
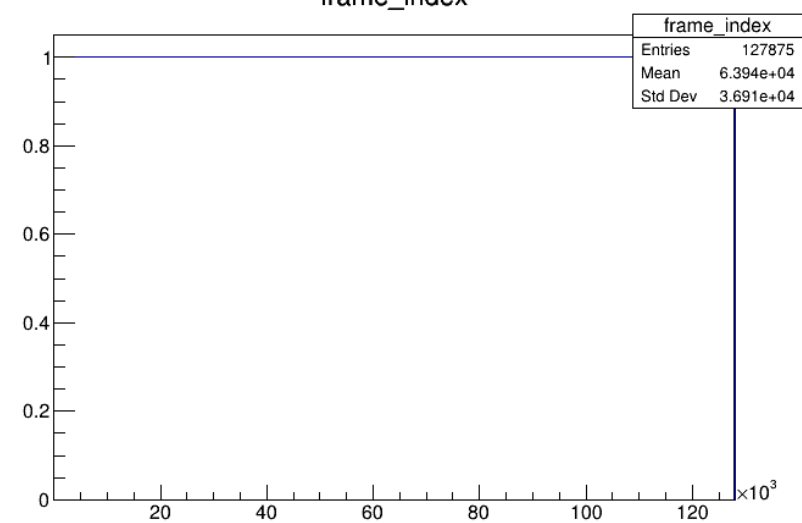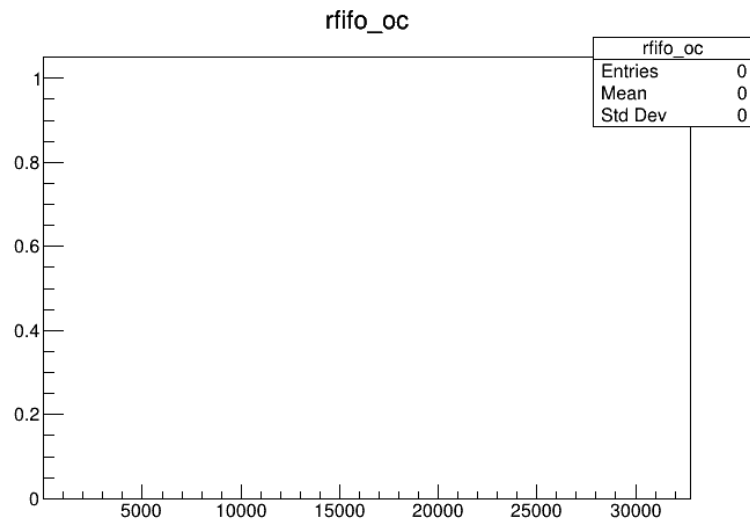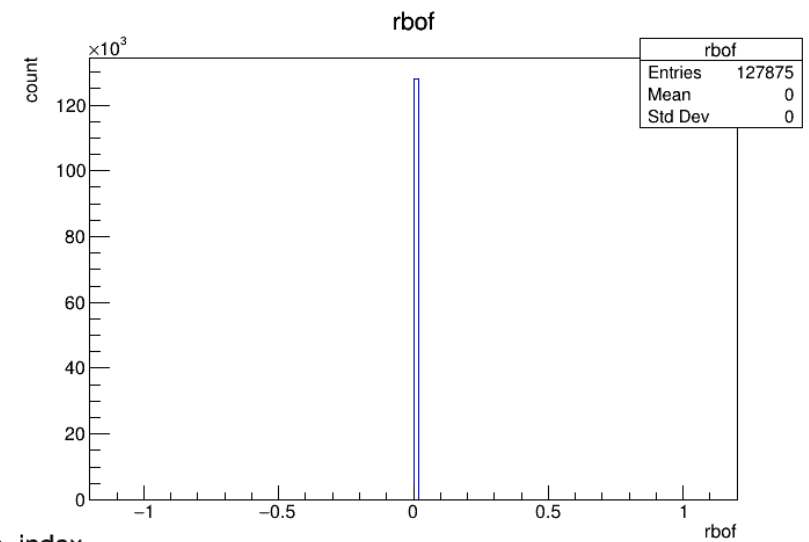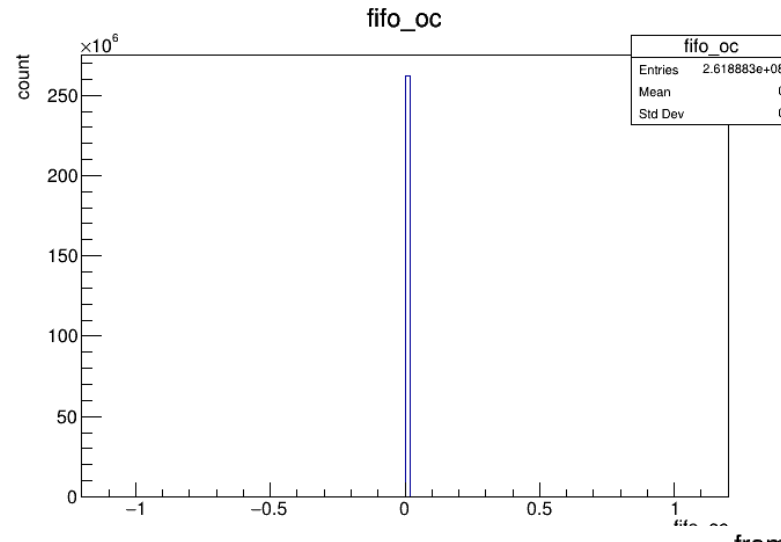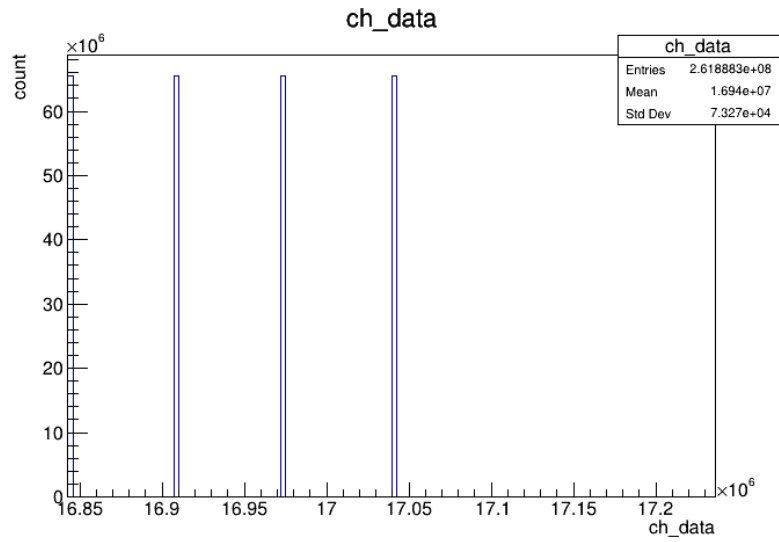
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Jumbo Frames

- Jumbo Frame transmission succeed.
  - Howto:
    - Firmware:
      - BUFWIDTH changed, from 4 to 6
      - ADDRWIDTH changed, frome 11 to 13
    - OS NIC config:
      - sudo ip link set eth0 mtu 9000
    - uHAL:
      - Increasing the return values of the getMaxSendSize() and getMaxReplySize() methods of the UDP and TCP classes from 1400 to 8900 (for example) on lines 135 and 142 of uhal/uhal/src/common/ProtocolUDP.cpp as well as on lines 136 and 143 of uhal/uhal/src/common/ProtocolTCP.cpp.
      - change line 66 of uhal/uhal/src/common/ProtocolUDP.cpp. mReplyMemory (9000 , 0x00000000),

- Transfer quality is quite improved.

Result Plots

Software Optimization

Large memory and disk space will be occupied.

Memory	➡	.txt File	➡	.root

```
2020-12-07 13:43:36 sdong-ubuntu __main__[11670] INFO Transfer speed: 1637.822142 Mbps
2020-12-07 13:43:36 sdong-ubuntu __main__[11670] INFO Write data to .txt ...
2020-12-07 13:47:30 sdong-ubuntu __main__[11670] INFO Write file speed: 80.601704 Mbps
2020-12-07 13:47:30 sdong-ubuntu __main__[11670] INFO Write to .txt end.
2020-12-07 13:47:30 sdong-ubuntu data_analysis.data_analysis[11670] INFO Write data to .root ...
2020-12-07 13:50:35 sdong-ubuntu data_analysis.data_analysis[11670] INFO Write to .root end.
2020-12-07 13:50:35 sdong-ubuntu data_analysis.data_analysis[11670] INFO Start drawing plots...
```

Write speed (to .txt and .root) is slow.

```
1  [                    0.0%]    4  [||                  1.3%]    7  [||||||||||||||||||||100.0%]    10 [||                  5.1%]
2  [|                   2.6%]    5  [|                   0.7%]    8  [                    0.0%]    11 [|                   2.6%]
3  [||                  2.6%]    6  [|                   0.7%]    9  [||                  2.0%]    12 [|                   2.6%]
Mem[||||||||||||||||||||||||||||||||||    23.1G/62.4G]    Tasks: 201, 967 thr; 2 running
Swp[||||||||||||||||||||||||||||||||||     1.23G/2.00G]    Load average: 1.56 1.80 1.75
                                                           Uptime: 01:57:06
```

Memory usage is high.