

# LRS rack tests at LArTF

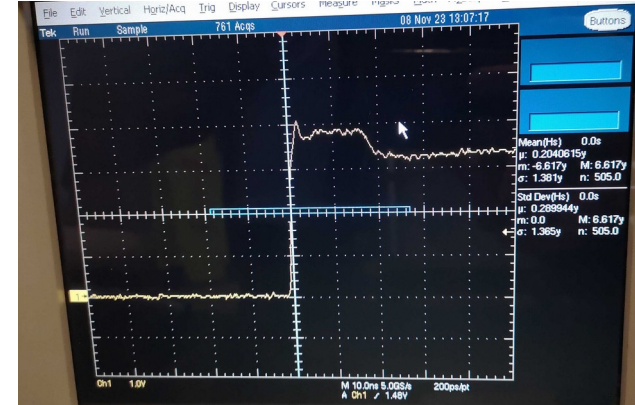
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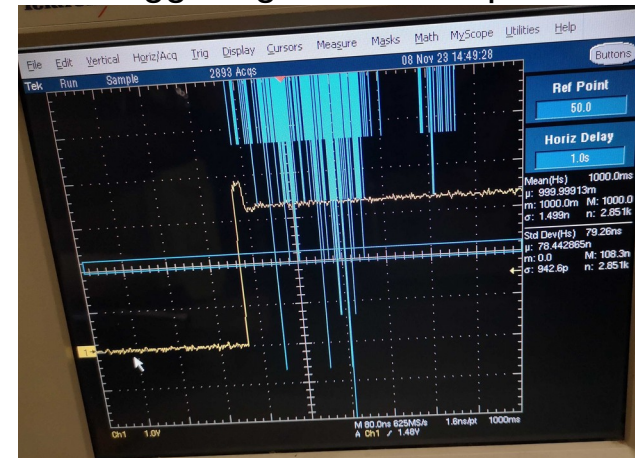


# White Rabbit TTL timing jitter

- Jitter measurement of the internal clock signal of the White Rabbit (WR)
- The WR was not connected with GPS
- First the rising slope of the first pulse was measured with a histogram
- It stayed the same slope and timing for all the triggers
- The second measurement was taken as a delayed pulse recognized of the first trigger
- The histogram shows, where the second trigger occurred
- There is a mean offset of 870 ns observed
- The histogram shows a drifting of the clock of about 360 ns
- Solutions could be:
  - Connect the WR to the GPS signal
  - Connect the WR to the DUNE timing
  - Readout the WR pps signal with an ADC



Triggering on the first pulse



Measuring the jitter on the second pulse

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Together with Yifan Chen and Bruno Gelli

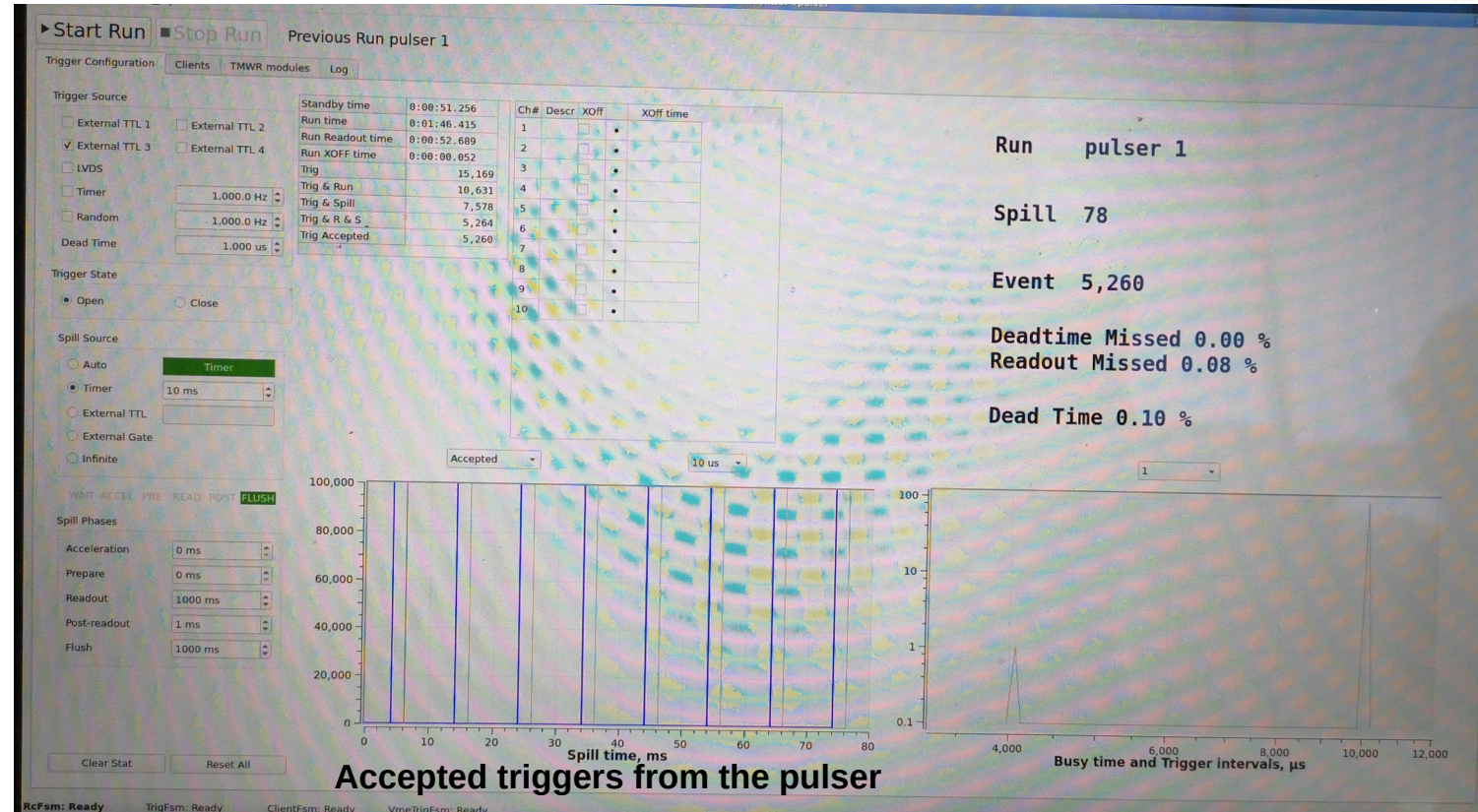
# Double pulse: Spill and LRS sum trigger

- Double pulse sent to the trigger unit
- Checking that in the defined dead time before the spill no trigger gets accepted
- Worked as expected



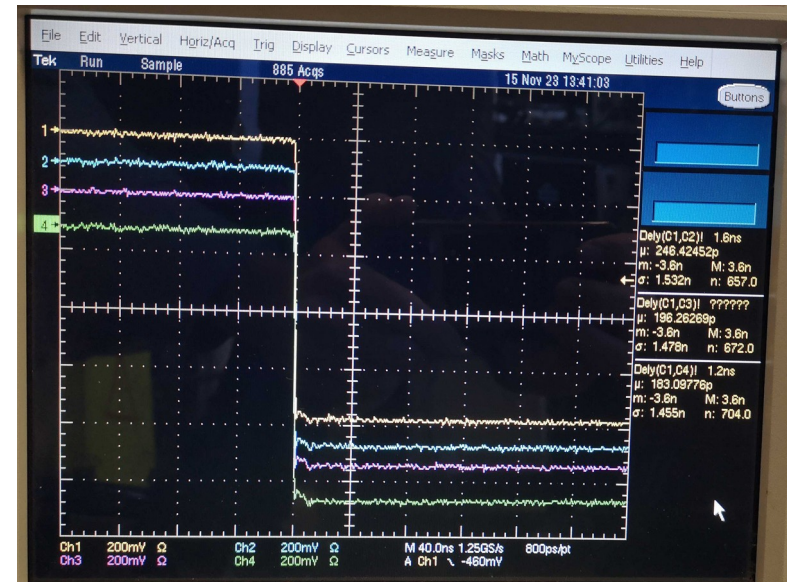
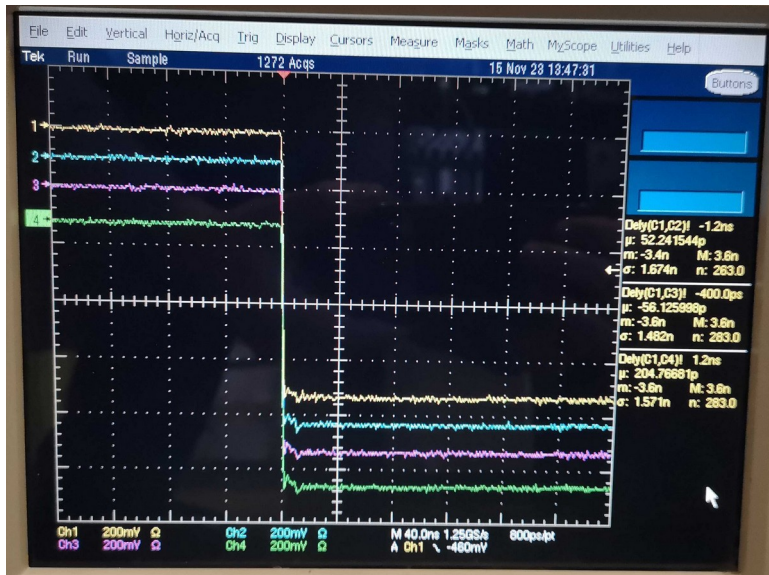
# LED pulser trigger signal

- Trigger of the pulser gets accepted by the trigger unit
- LRS DAQ system notices the triggers



# Fan-out jitter

- TTL of WR to Fan-out compared to each other
- Min. and Max. difference: +/- 3.8 ns
- Standard Deviation: ~ 1.5 ns



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# Summary and Outlook

- The jitter on the WR pps signal will be compared to the jitter on the ADC connected to WR optically
  - This measurement is done with triggering the ADC on the pps signal while running the internal clock on the ADC
  - It is not yet evaluated
- Check if the ADC is able to process the WR signal to get a WR pps signal timestamp on the light data files