

Toy: burst trigger mode

Pelle

Ideal setup

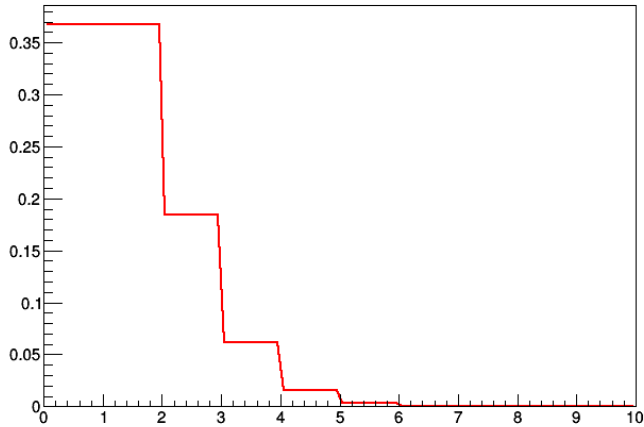
Ideal setup in the following means

- Pipeline depth = 5
- Readout time = 20.6us
- Time between triggers = 100ns

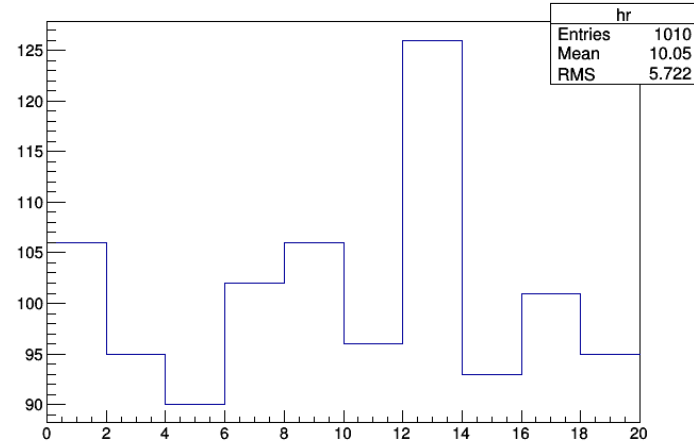
I use a 50kHz trigger rate for the following
("ungated" as some people call it)

Ideal setup

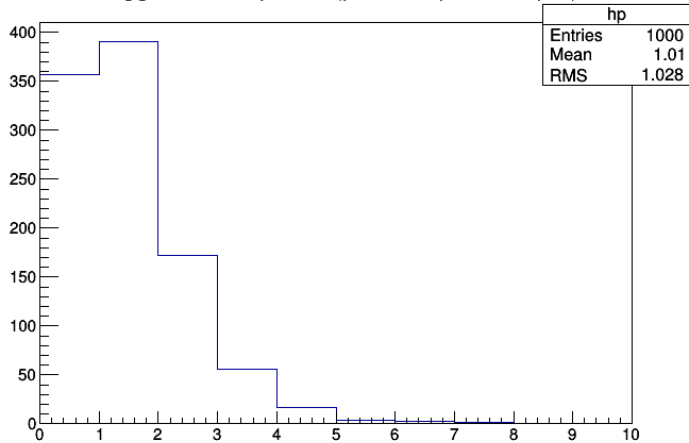
TMath::PoissonI(x,[0])



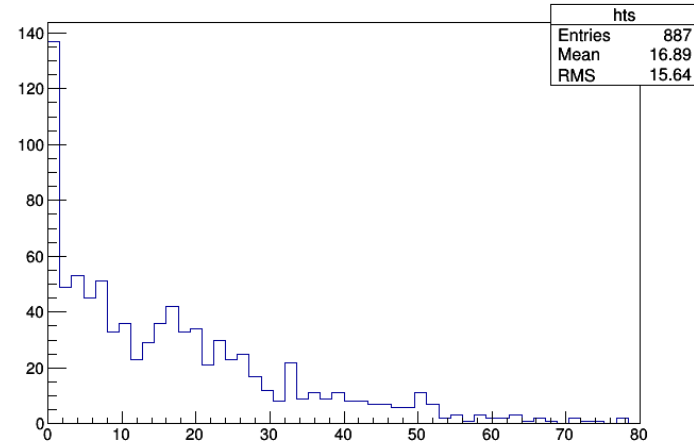
Trigger time within period (per=20.0μs dt=0.1μs)



Triggers within period (per=20.0μs dt=0.1μs)



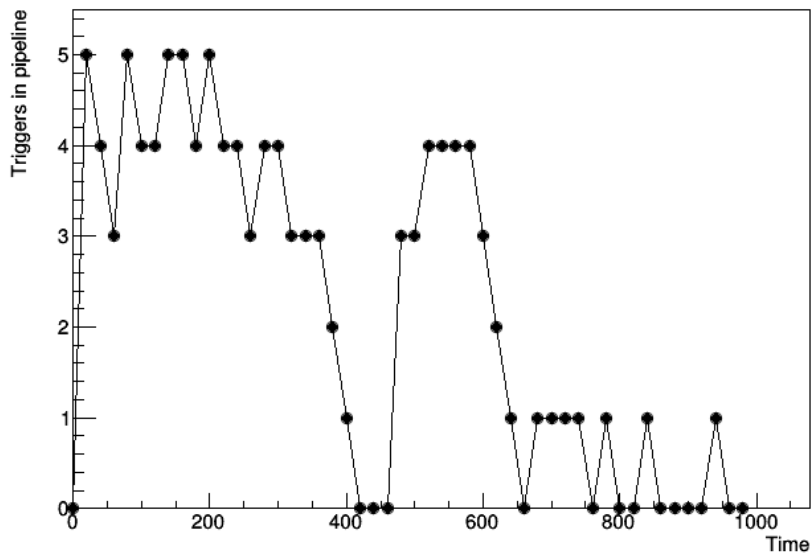
Trigger time b/w accepted triggers (per=20.0μs dt=0.1μs)



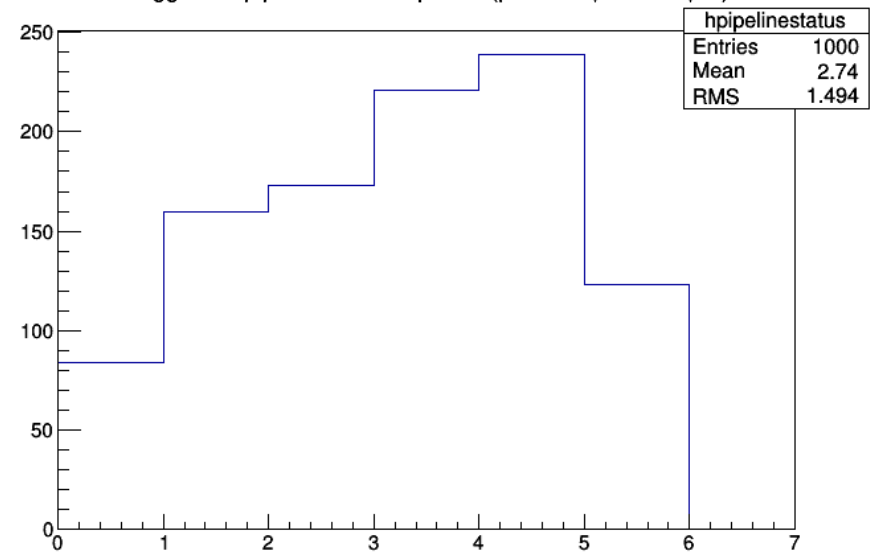
Actually means trigger time to latest trigger in pipeline. '0' if no trigger in pipeline

Ideal setup

Triggers in pipeline at each period vs global time (per=20.0 μ s dt=0.1 μ s)



Triggers in pipeline at each period (per=20.0 μ s dt=0.1 μ s)



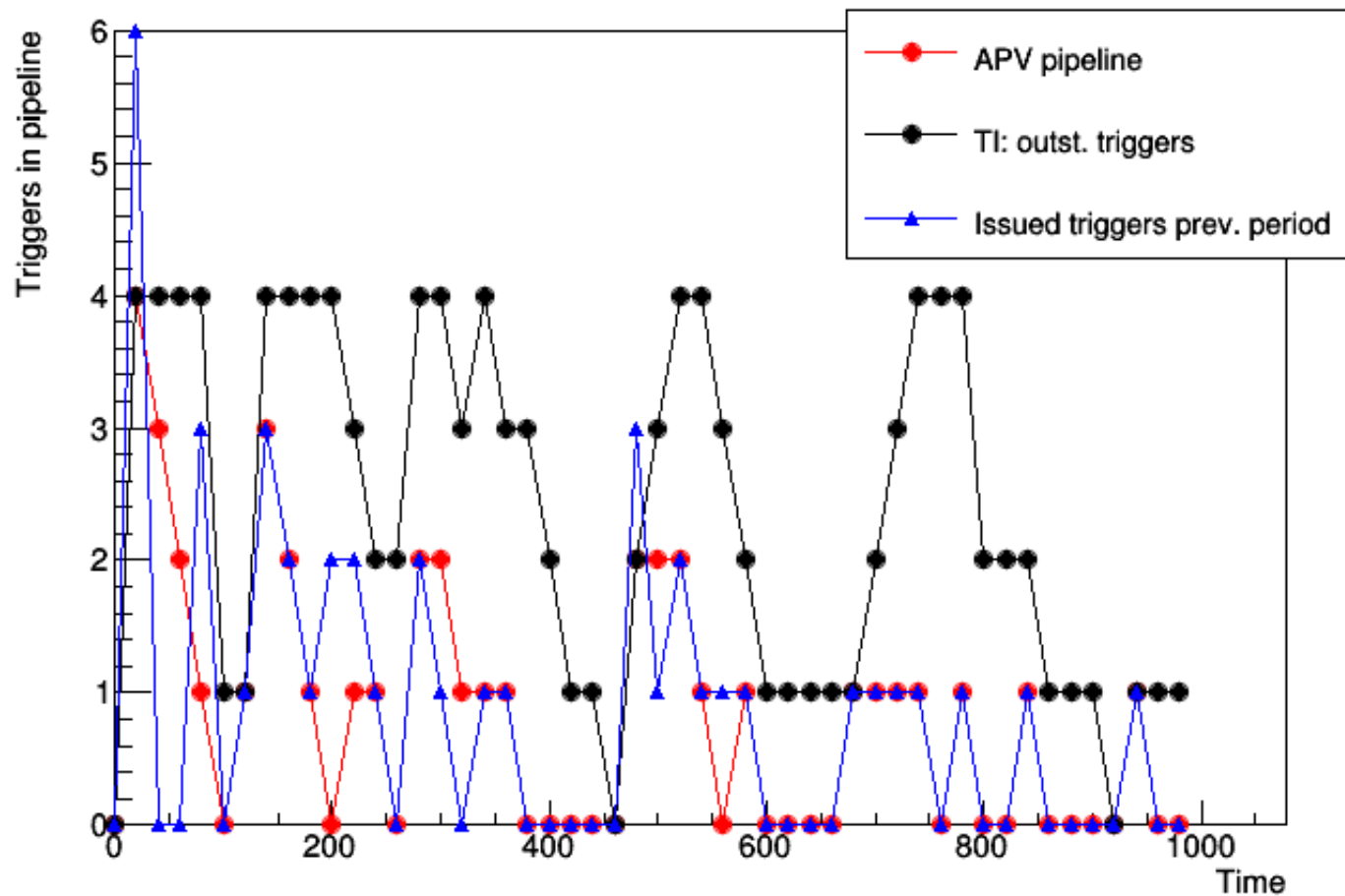
“TI Rules” means a sliding window to restrict outstanding triggers to avoid overwhelming the APV25 pipeline buffer

Used in the engineering run:

- TI_RULES_1 1.4
 - $\geq 1.4\mu\text{s}$ b/w consecutive triggers
- TI_RULES_4 88.4
 - At most 4 outstanding triggers in $88.4\mu\text{s}$

TI Rules

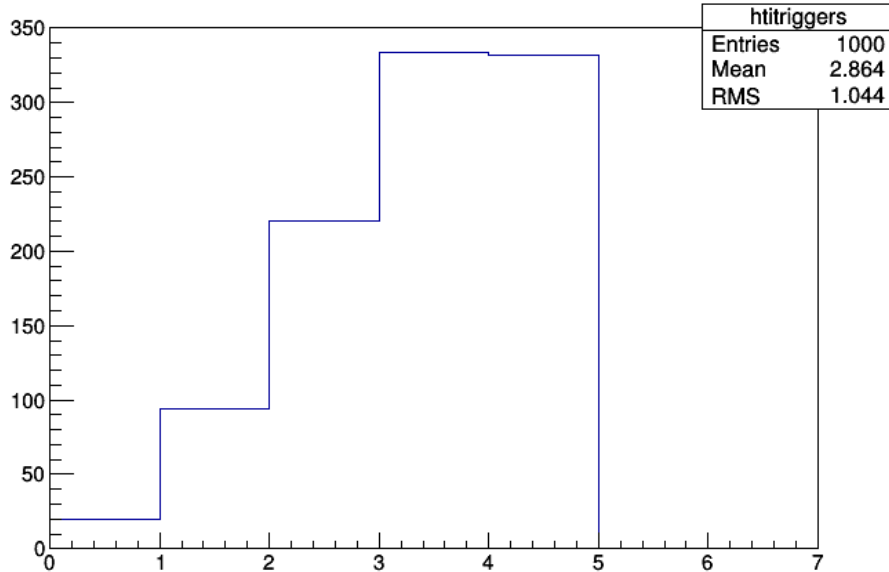
Triggers in pipeline at each period vs global time (per=20.0 μ s dt=0.1 μ s TI-1=1.4 TI-4=88.4)



TI Rules

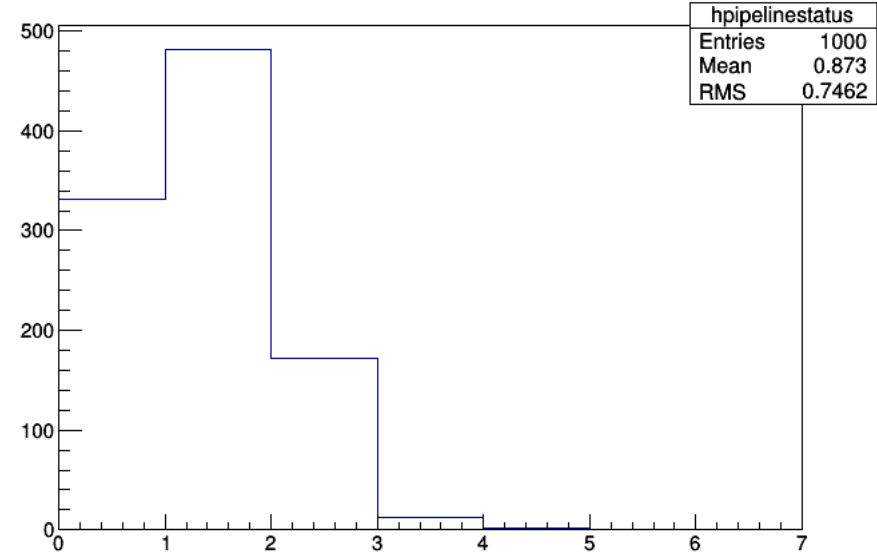
Outstanding triggers

TI triggers outstanding at each period (per=20.0 μ s dt=0.1 μ s TI-1=1.4 TI-4=88.4)

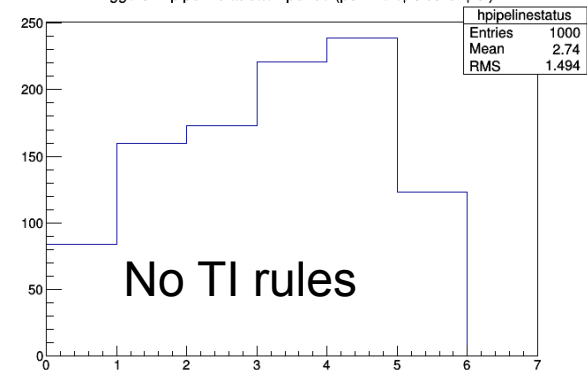


Triggers in pipeline

Triggers in pipeline at each period (per=20.0 μ s dt=0.1 μ s TI-1=1.4 TI-4=88.4)

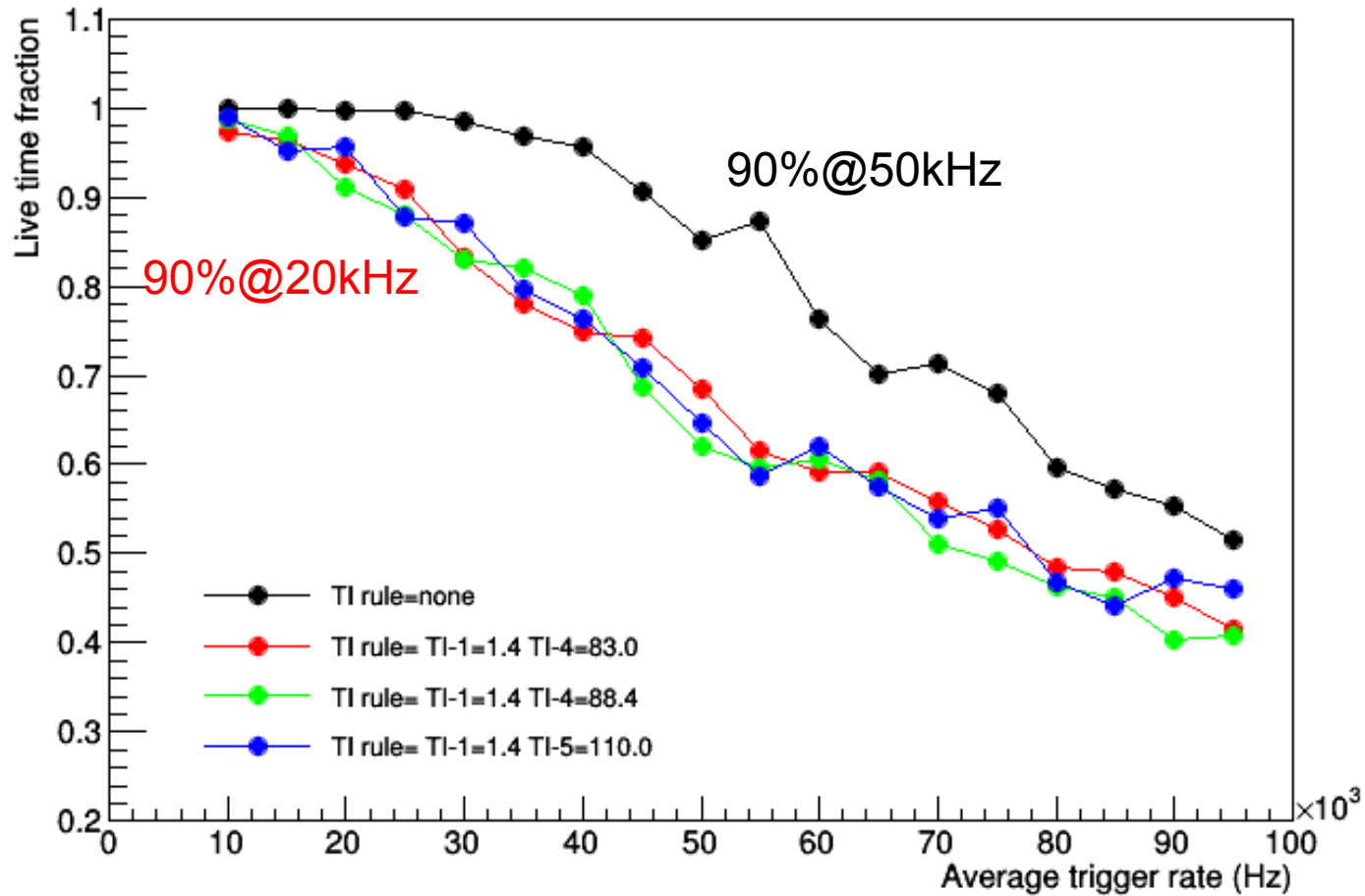


Triggers in pipeline at each period (per=20.0 μ s dt=0.1 μ s)



Ideal vs eng run

Data taking efficiency

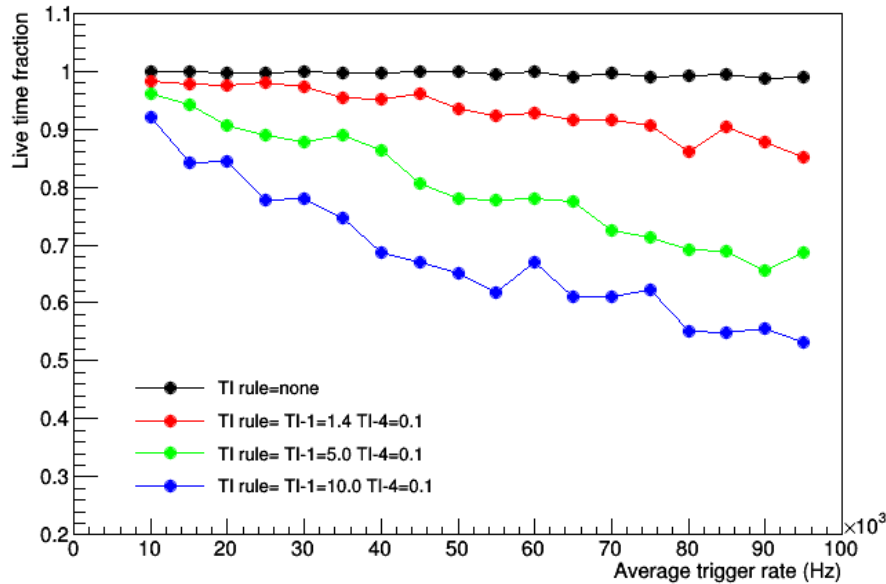


Extras: Ideal setup: short readout time

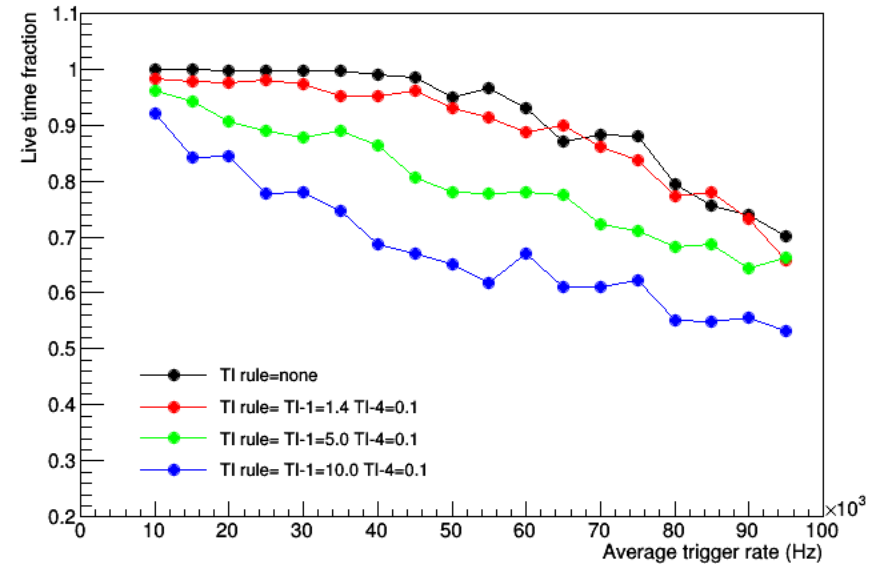
5us readout

15us readout

Data taking efficiency



Data taking efficiency

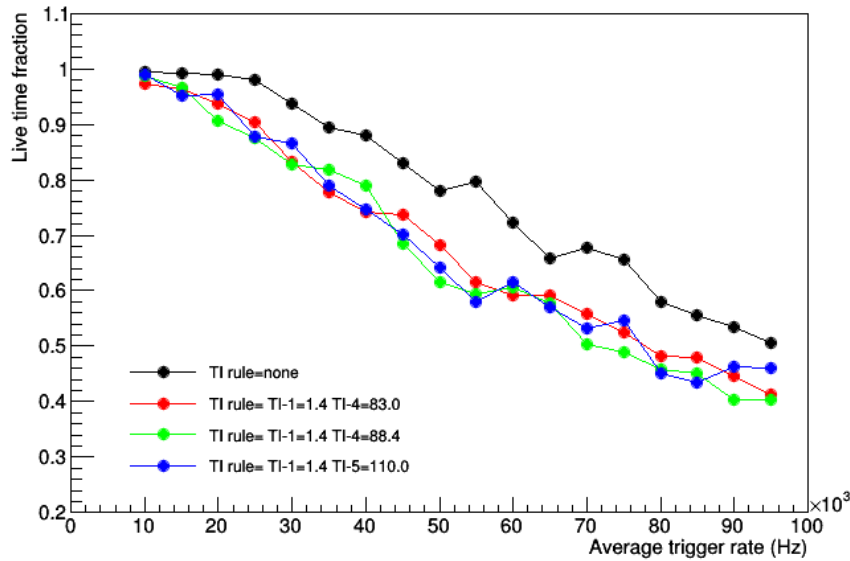


Different curves restrict min time b/w consecutive triggers.

Extras: Pipeline depth

Depth=3

Data taking efficiency



Depth=4

Data taking efficiency

