

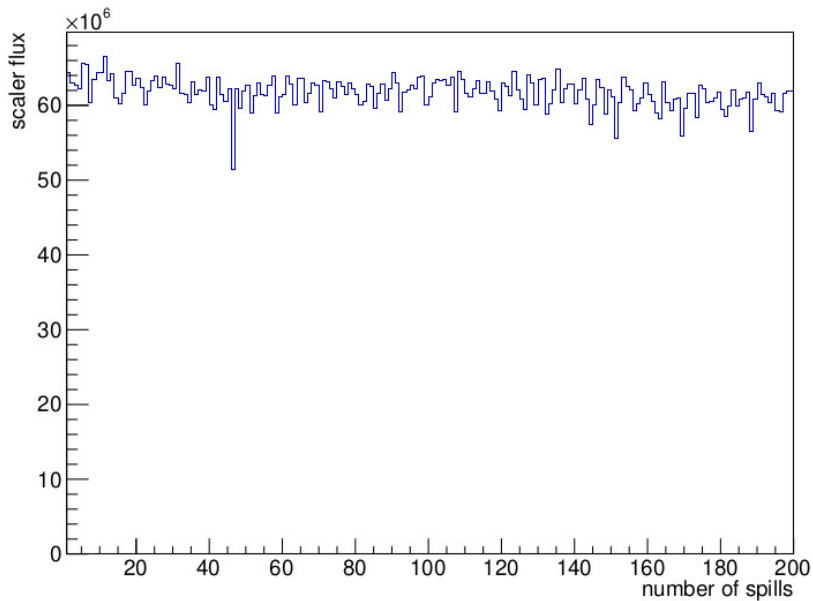
2 Methods:

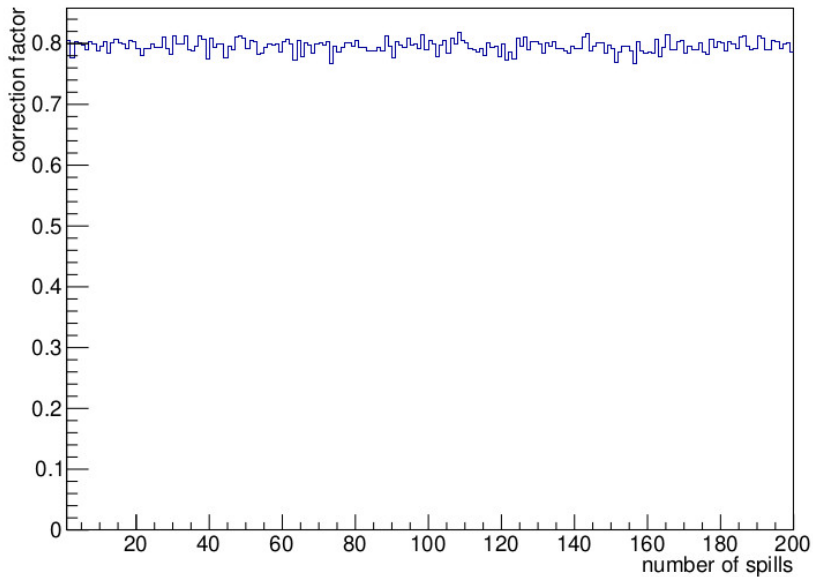
- Scaler method: use scaler connected to FI02X plane
- Random trigger method: data selection of good beam tracks in RT events

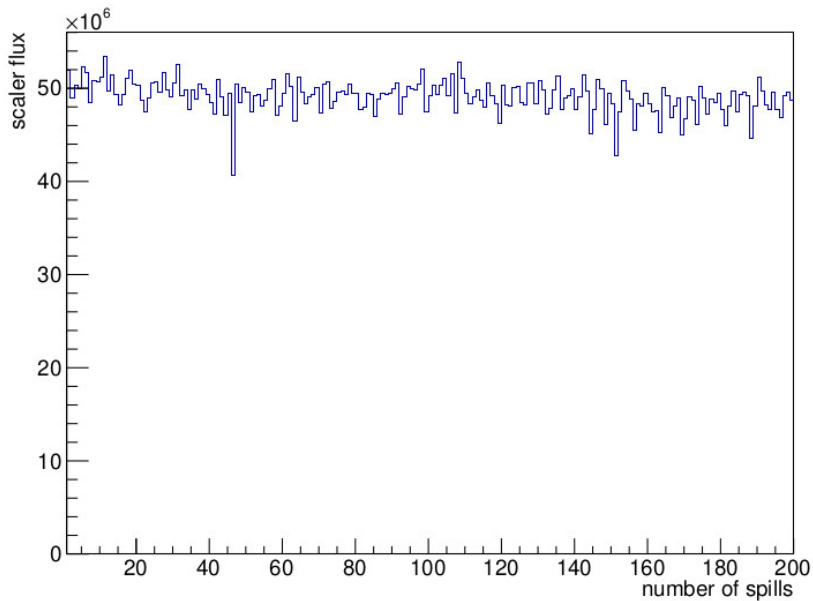
- Get scaler values of FI02X plane
 - PHAST::e.vMiscScalers() vector
 - ⇒ total of 96 entries starting with entry 98
 - vector saved spill by spill
- Correction: size of FI-plane \neq target diameter
 - $F_{corr}(spill) = \frac{tracks_{RT,FI,target}}{tracks_{RT,FI}}$
 - $tracks_{RT,FI}$: #Tracks in RT event with hit in FI02X
 - $tracks_{RT,FI,target}$: #Tracks in addition crossing the target

Target cut 2016:

$-318.5 \text{ cm} < z_{target} < -78.5 \text{ cm}; R = 1.5 \text{ cm}$







RT flux:

$$Flux_{RT} = \frac{\text{\#of reconstructed RT beam tracks}}{\text{\#of RT attempts} \cdot \Delta t}$$

#of RT attempts: PHAST::e.vMiscScalers() vector entry 61

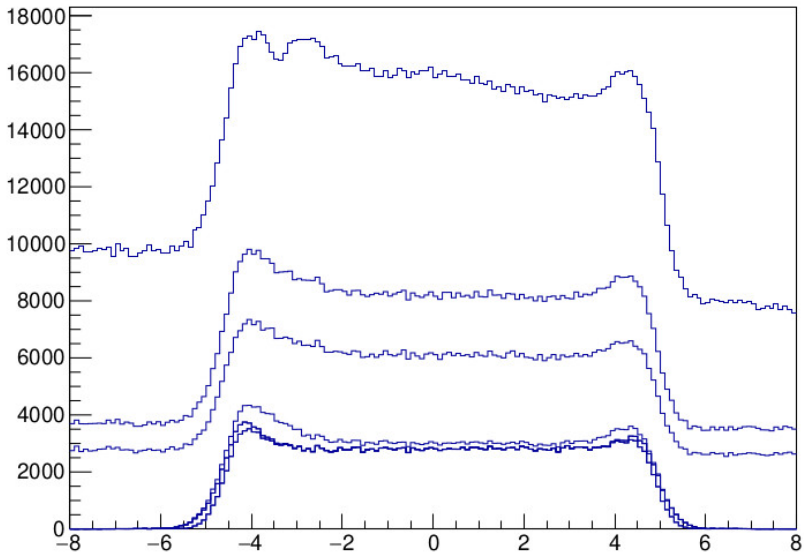
· Δt : chosen track meantime: $\pm 2\text{ns}$

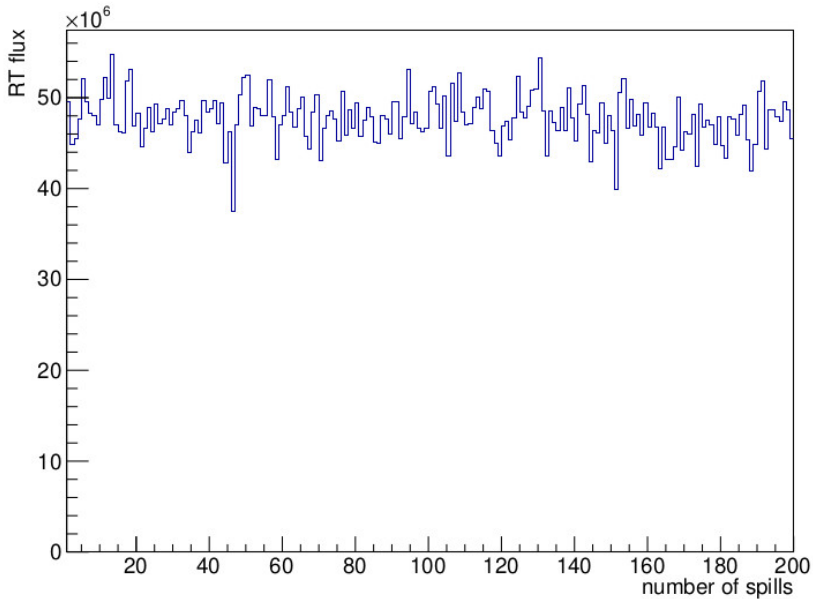
#of reconstructed RT beam tracks: Data selection

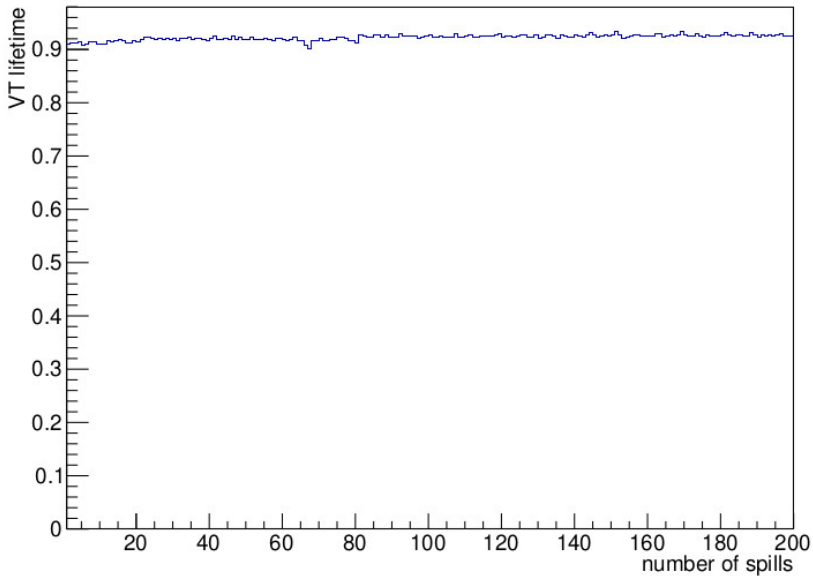
- #hits BMS > 2
- beam has crossed target
- Zfirst < target max.
- $140 < \text{mom} < 160 \text{ GeV}/c$
- mom error < $0.025 \cdot \text{mom}$
- meantime of track $\pm 2\text{ns}$
- #hits in FI > 2
- #hits in SI > 3
- time in spill: fixed $1.5 < \text{TiS} < 5 \text{ sec}$
 $1.5 < \text{TiS} < \text{variable ending}$

⇒ Veto deadtime: ratio MT events with VDT delay and without

→ RT is not vetoted correction: $\text{Flux} \cdot (1 - \text{VTD})$



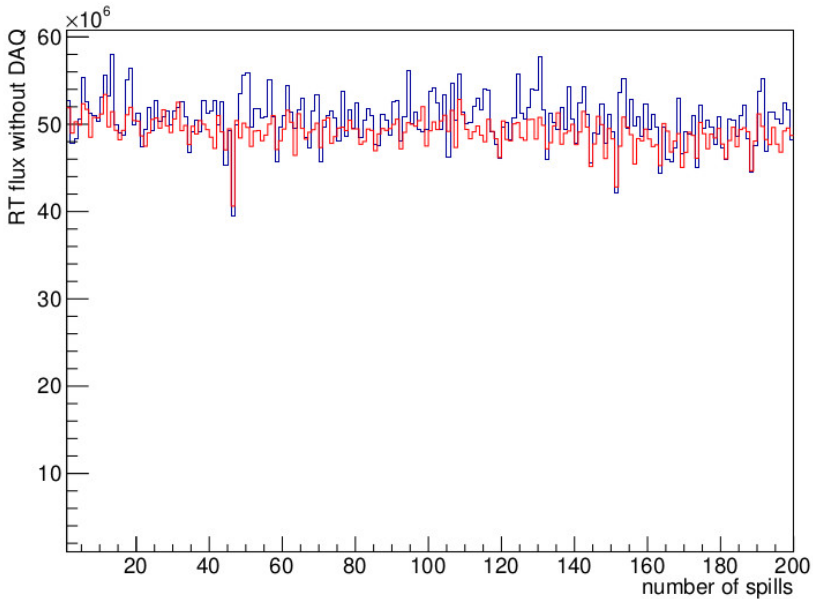




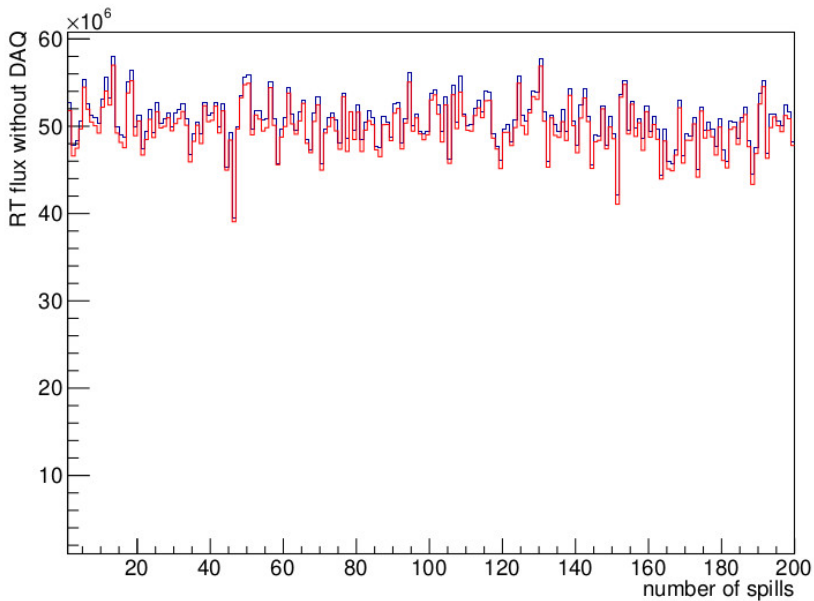
Compare both flux: #of reconstructed RT beam tracks is biased by DAQ
deadtime

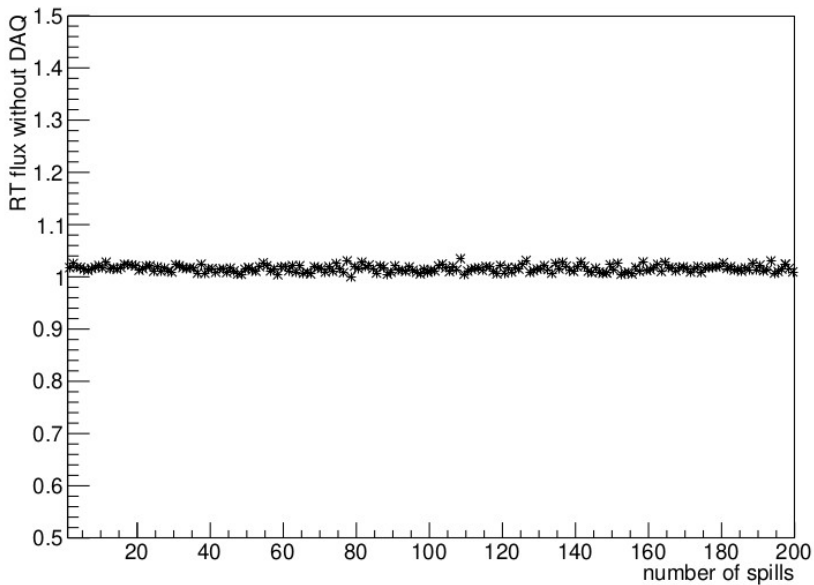
→ DAQ deadtime (RT) = $\frac{\# \text{ accepted RT}}{\# \text{ RT attempts in time in spill window}}$

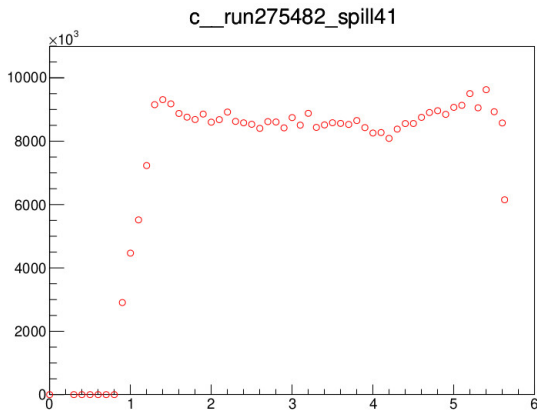
unbiased RT flux: $\text{RT flux} \cdot (1 + \text{DAQ deadtime}) \approx 6\text{-}7\%$



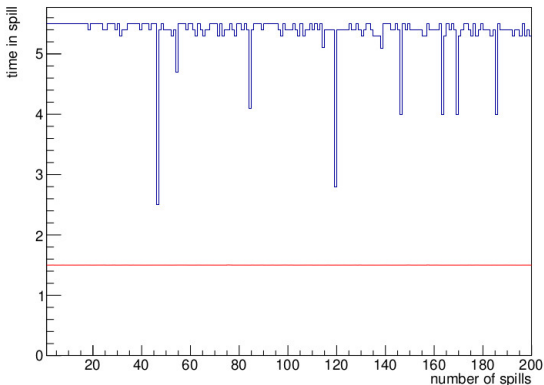
Compare to RT flux by Andrea I







Condition: Spill lasts until scaler rate at time in spill $< 0.9 \cdot$ average rate starting at 1.5 sec until current time in spill value (bin width 0.1 sec)



Time in spill window ~ 5.5 sec, notches unstable beam conditions
Think about other condition like checking the amount of bins which are lower than average

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