Beam summary in MR Run41

A.Murakami for beam group

Data set

- Good spill selection for run#410138(3/14)~410171 (3/16)
  - Total # of spills of physic run : 37899
- Horn current settings in this period : 200kA

Spill selection

Quick spill selection

1. Physics run
   - "run_type" is "physic run" and all Horn ON
   - exclude spills for beam tuning, beam study
2. TriggerFlag is "Beam Trigger" (beam during MR operation)
3. Good GPS status
4. CT05 # of protons per spill > 1e11 in order to exclude spills which no beam in MR (due to machine interlock etc...)

5. Normal condition cut
   - exclude unusable spills (e.g. PV2 magnet unstable etc...)

Good spill selection

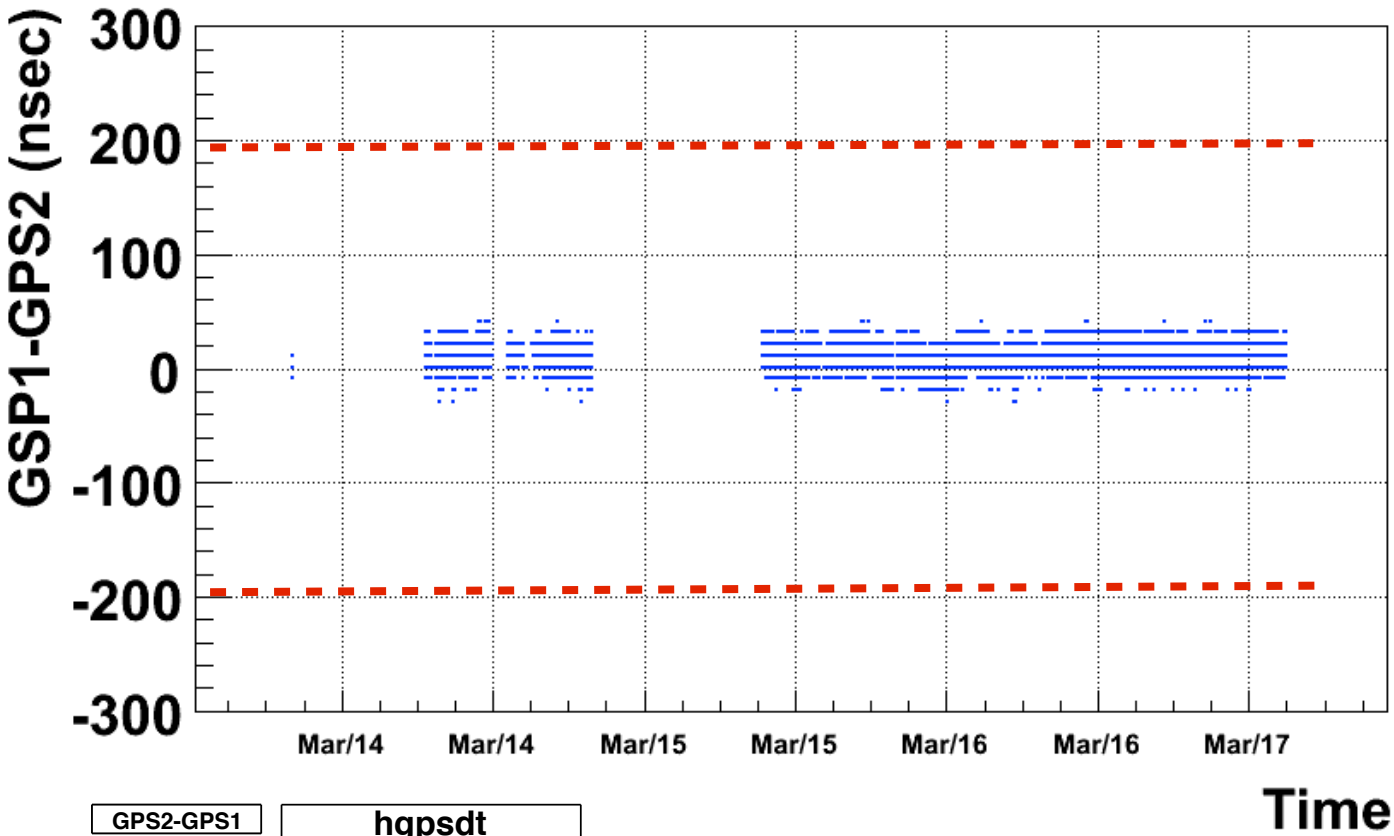
6. Horn current cut
   - Nominal current ± 5 kA for all three horns
7. MUMON cut
   - beam angle within 1mrad (|Si fit X|<10cm & |Si fit Y|<10cm)
   - Si total Q / CT05 cut : mean of Q/CT05 ± 5%

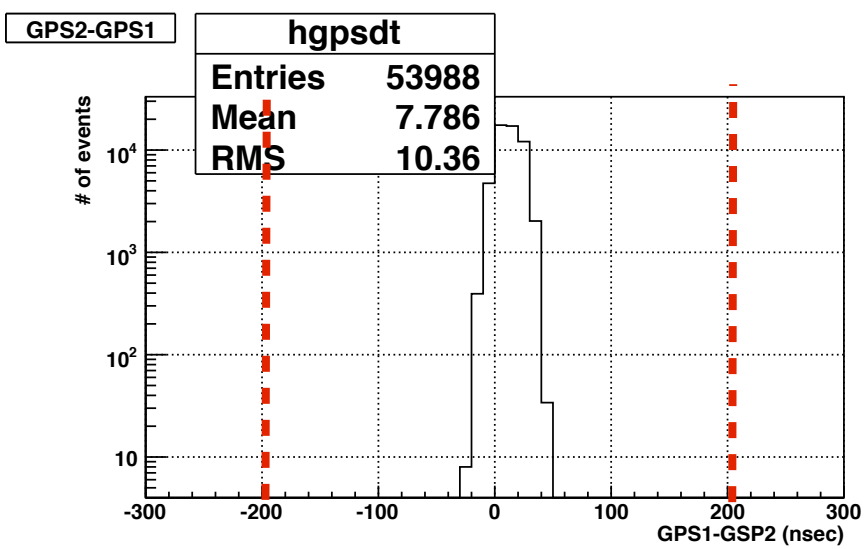
Good spill selecton

- Apply good spill selection for these physic run data
  - Horn current & MUMON Si Q /CT5 cut threshold are defined as the followings table.
    - Nominal Horn current = mean of three horns current in each period.
    - Nominal MUMON SiQ / CT5 = mean of this value in each period.

run#	Horn current setting	Horn current cut	MUMON SiQ/ CT5 cut
410052~410053	250kA	252.3 ± 5 kA	32.37 ± 5%
410065~410068	0kA	0kA	8.54 ± 5%
410074~	200kA	204.9 ± 5kA	21.8 ± 5%

GPS Status

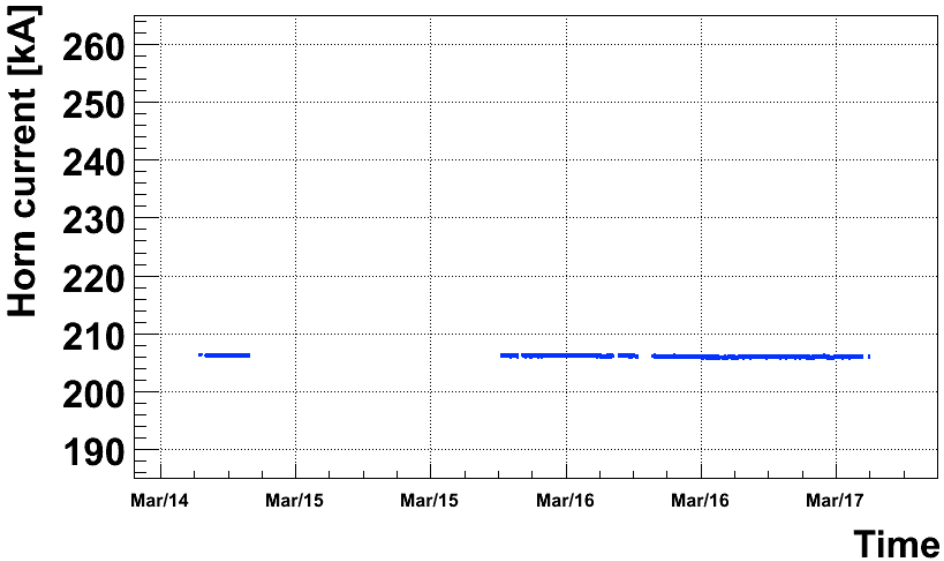




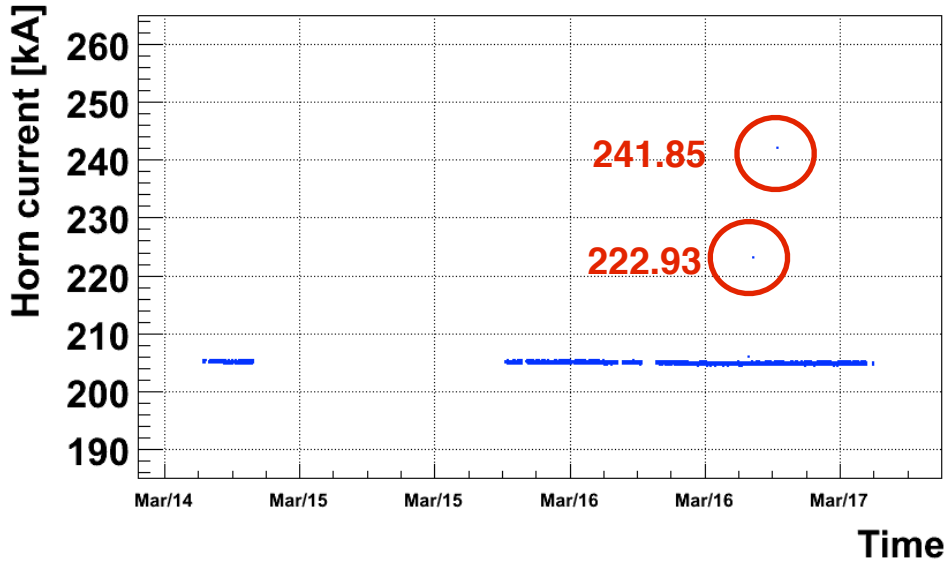
No Bad spill

Horn current

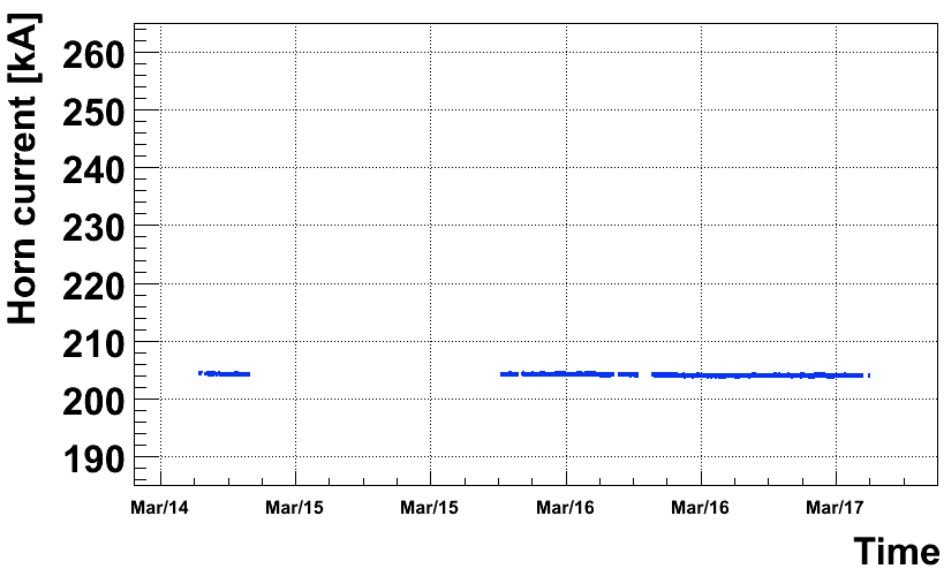
Horn1 current



Horn2 current



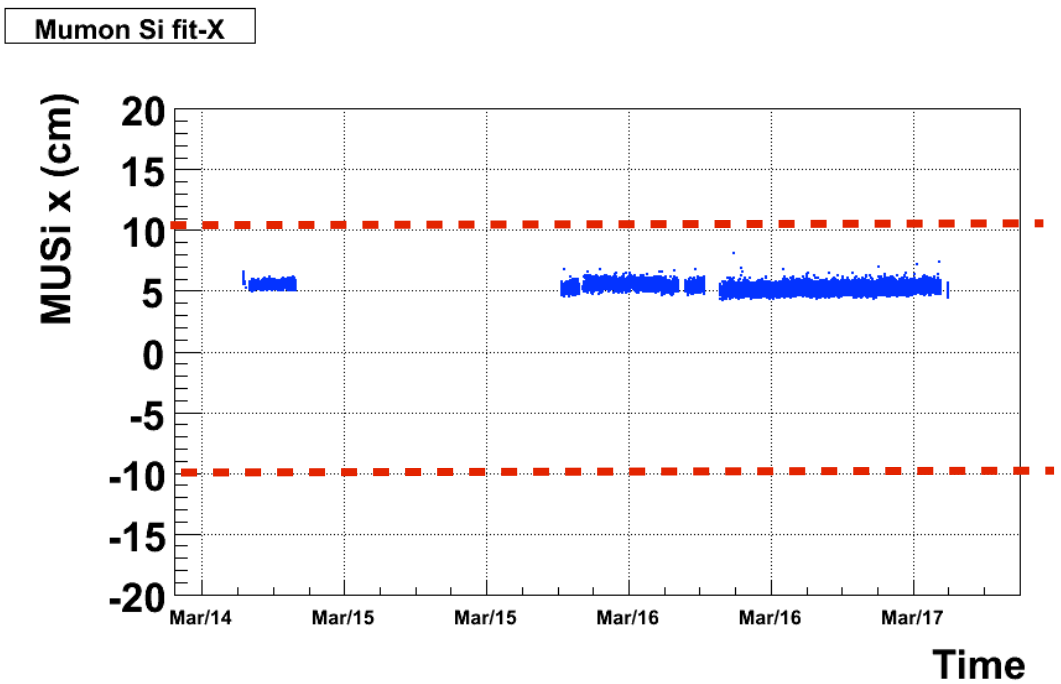
Horn3 current

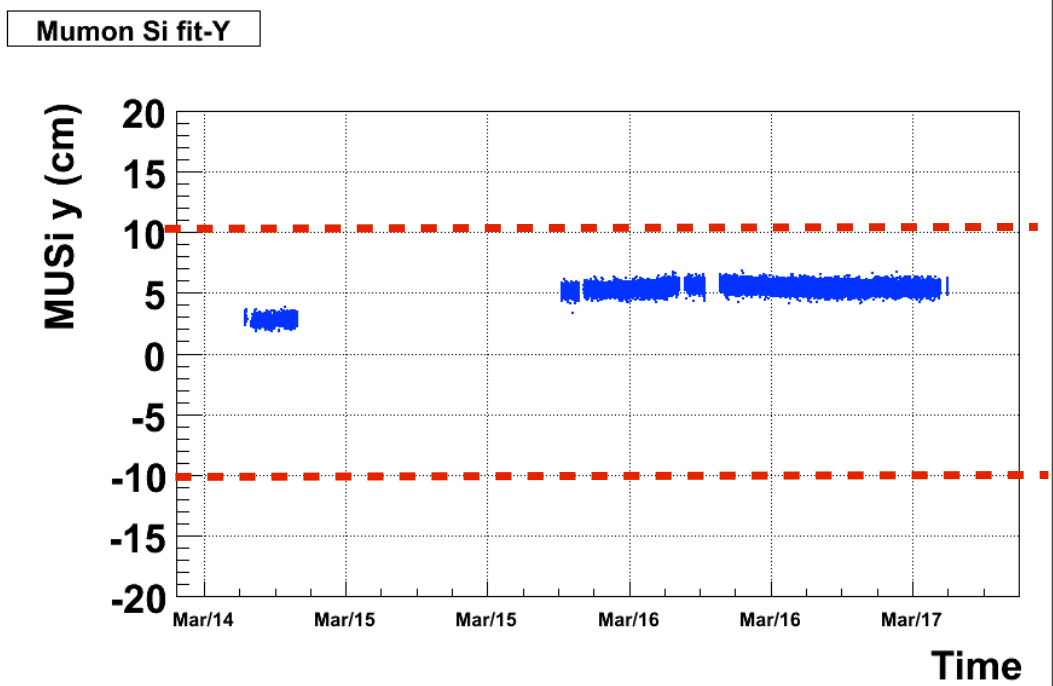


2 spills are bad spills

DAQ Run# = 410169
spill#=1824376, 1826990

MUMON Si fit center

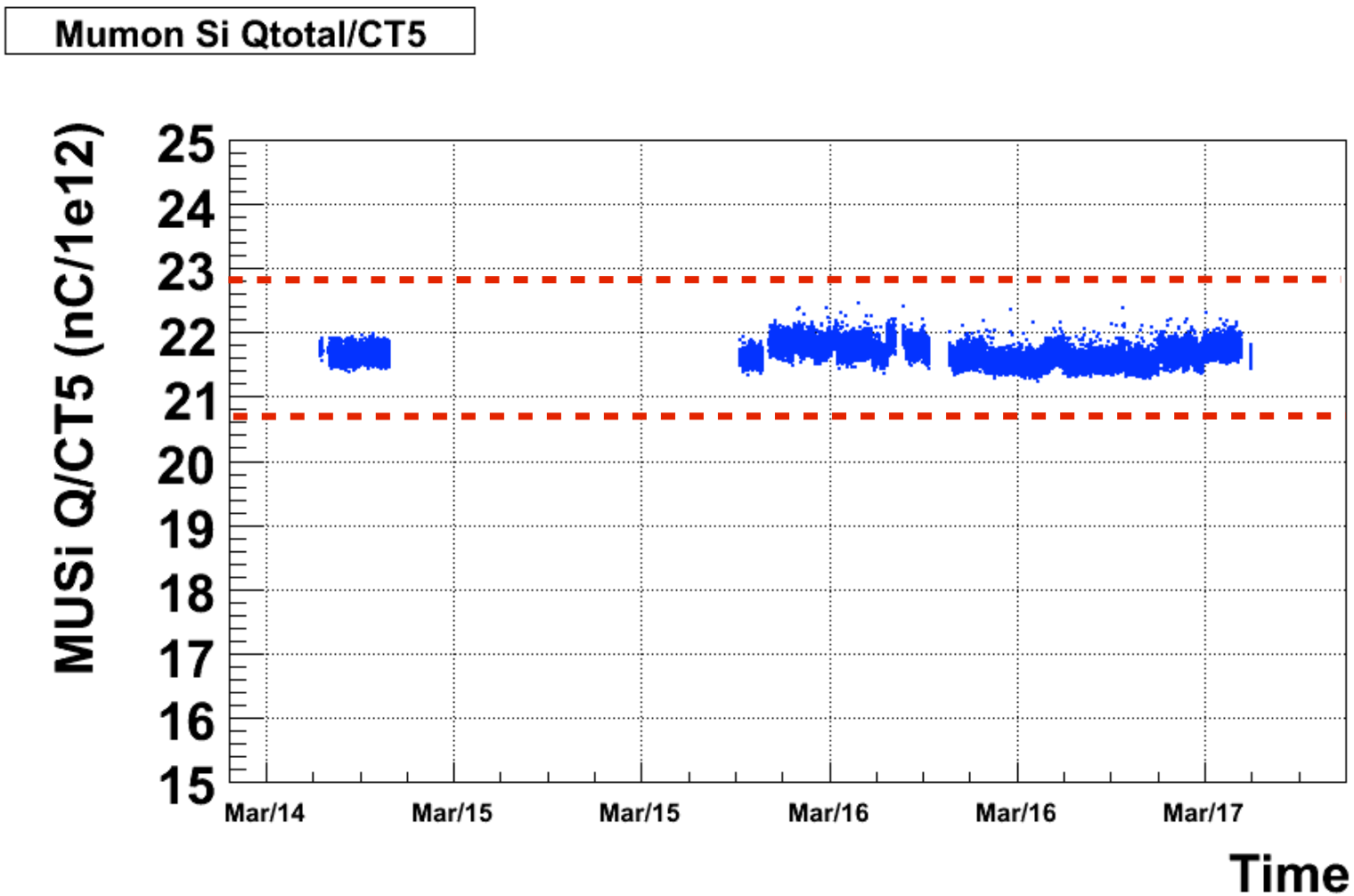




No Bad spill

(Exclude the bad spills failed by horn cut)

MUMON Si Q / CT05



21.8 ± 5%

No Bad spill

(Exclude the bad spills failed by horn cut)

Good spill for physics runs

- **#410138(3/14)~410171 (3/16) (horn=200kA)**

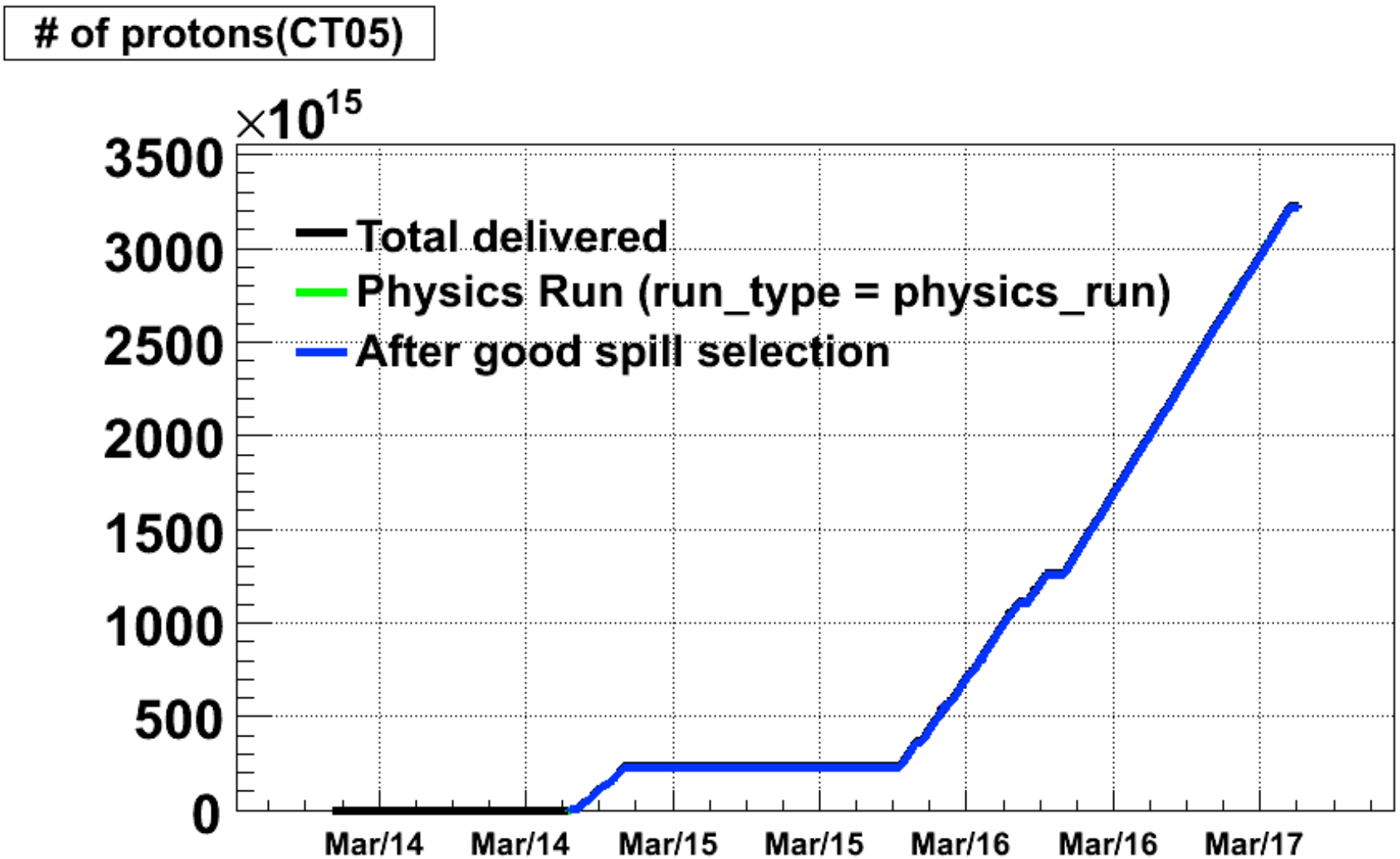
	# of spills	Ratio
Physics spills	37945	1
Beam trigger	37799	0.996
Good GPS	37799	0.996
ppp(CT5)>1e11	37765	0.995
Normal beam	37765	0.995
Horn cut	37763	0.995
MUMON cut	37763	0.995

# of delivered protons(CT5) after Good spill selection

Total POT : 3.221e18

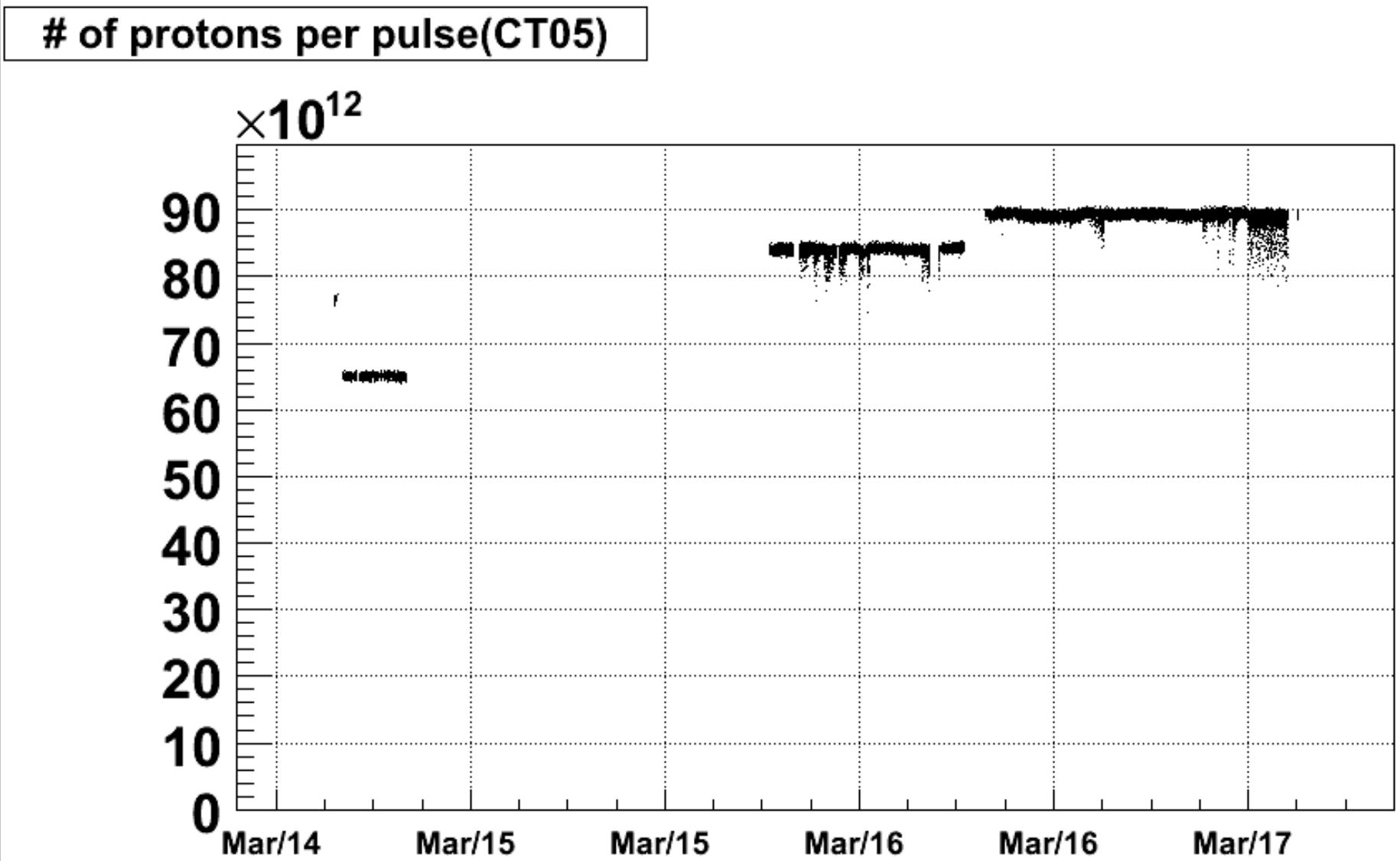
Integrated POT (MR Run41)

- #410138(3/14)~410171 (3/16) (horn=200kA)



Proton per pulse

- #410138(3/14)~410171 (3/16) (horn=200kA)



Definition of Good spill flag

- Rule:
  - In order to distinguish the Horn-off spill from the horn ON spill, the value of the good flag will be re-defined.
    - flag =0 : Not suitable data for physics analysis.
    - flag =1 : Good spill for Horn 250kA operation.
    - flag =100 : Good spill for Horn OFF.
    - flag = 2, 3 ... 99: Reserved for the other horn operation mode.
    - flag =-1,-2 ... -99: Reserved for the other horn operation mode with opposite polarity.

horn current	0 kA	200 kA	250 kA
good spill flag	100	2	1