Beam summary in MR Run41

A.Murakami for beam group

Data set

- Apply Good spill selection for the run# **410138(3/14)** ~ **410208(3/22)**
- 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%

Normal condition cut

- Remove these spills in run# **410192** by normal condition cut
  - spill#=1919127 : Beam stop due to MPS of MR Beam loss monitor
  - spill#=1919128 : 1 shot after recover of above MPS.
  - spill#=1919129 : Check beam condition (2bunch beam) after setting magnets
  - spill#=1919130 : Check beam condition (8bunch)

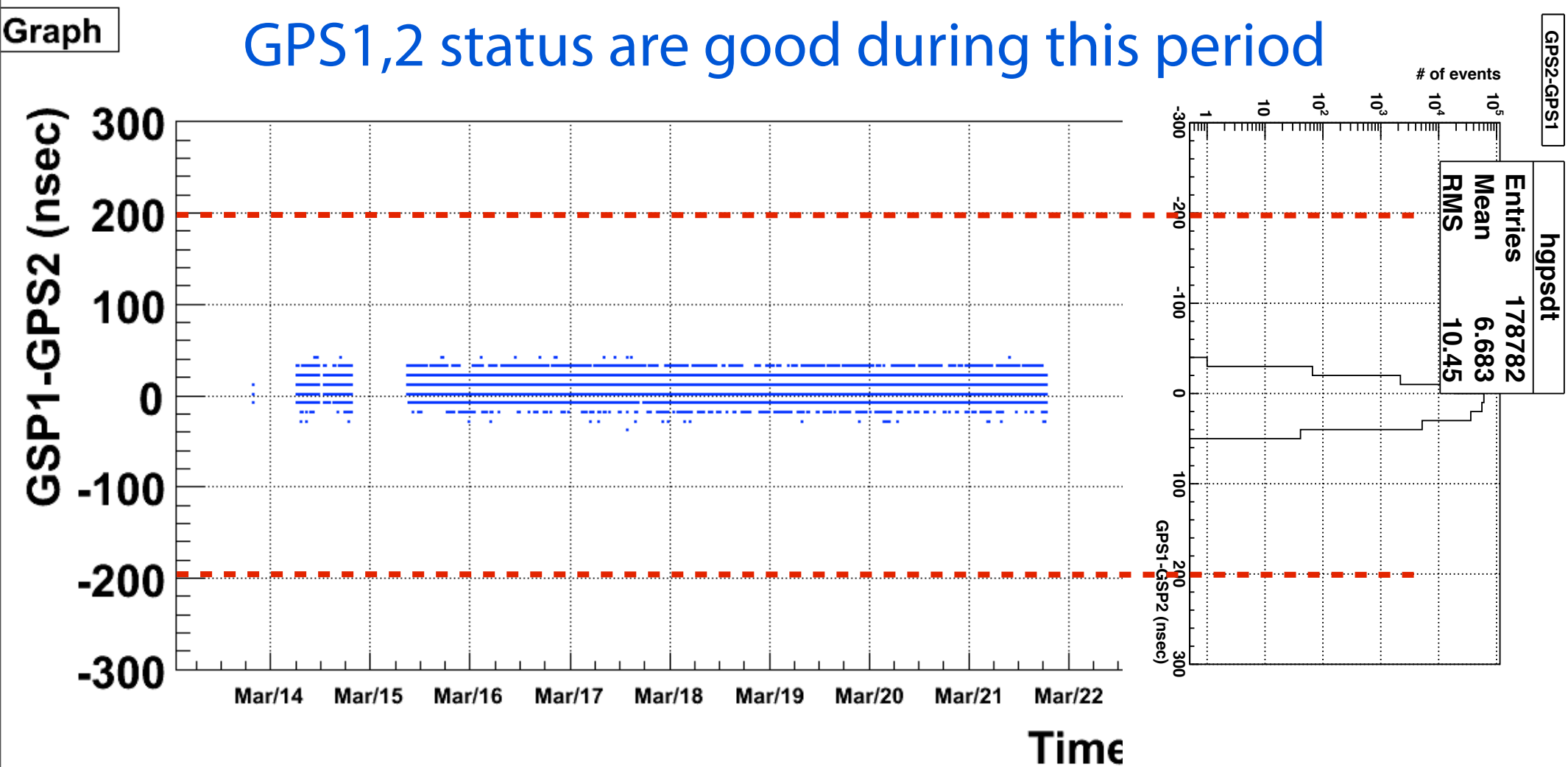
Threshold of horn & mumon cut

- Horn current & MUMON Si Q /CT5 cut threshold are defined as the followings table.
  - Nominal Horn current = mean of three horns current in physics run.
  - Nominal MUMON SiQ / CT5 = mean of this value in physics run.

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%
410074~410208	200kA	204.7 ± 5kA	21.65 ± 5%

GPS Status

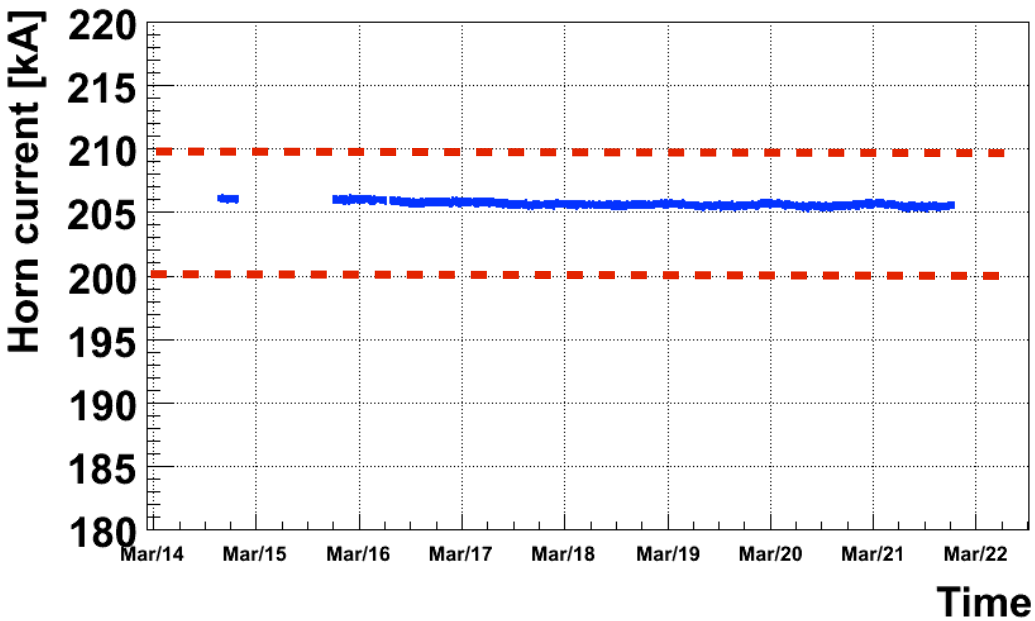
GPS1,2 status are good during this period



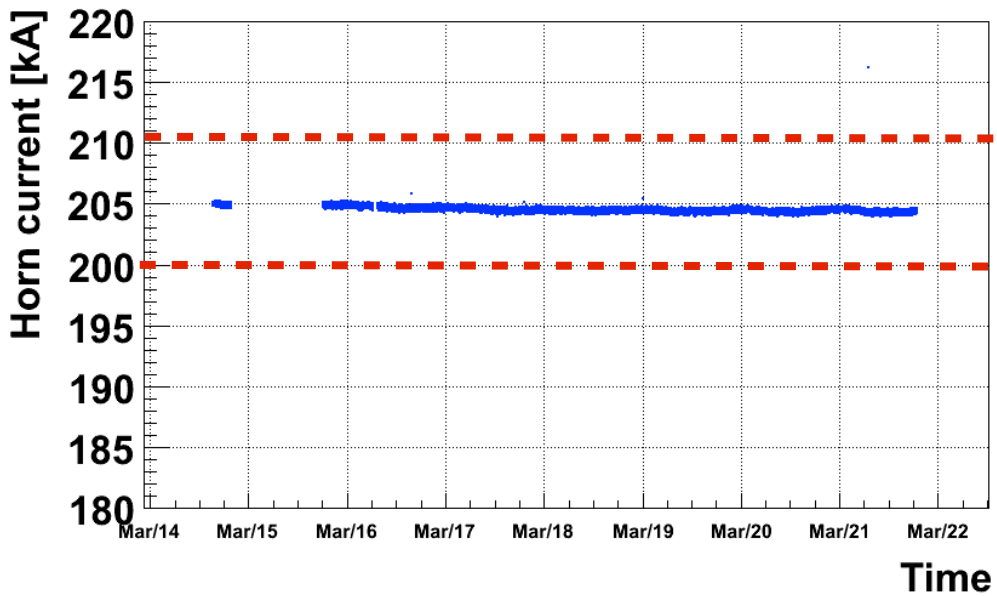
No Bad spill

Horn current

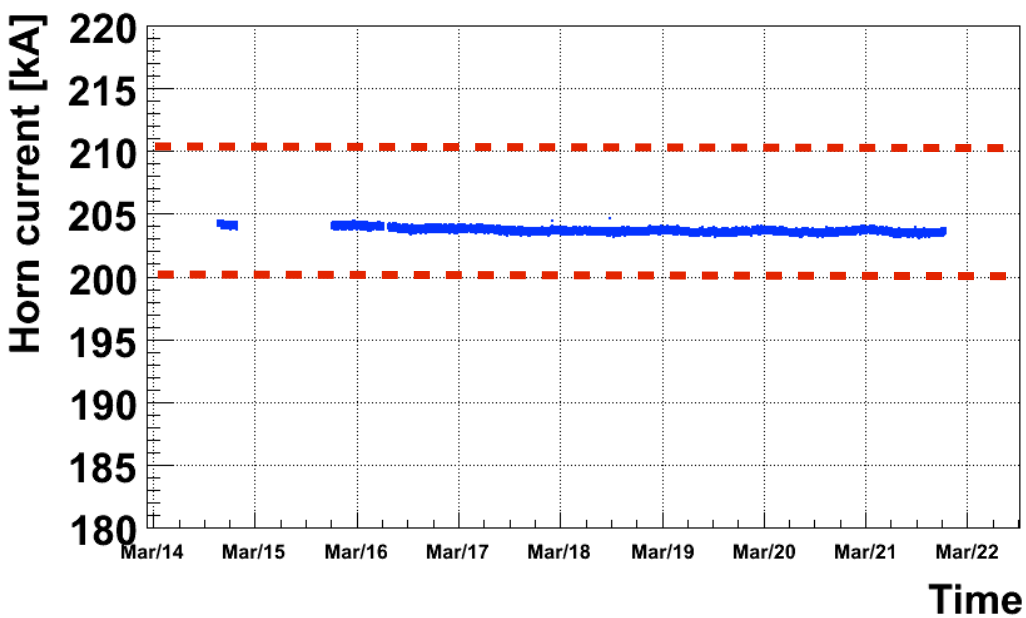
Horn1 current

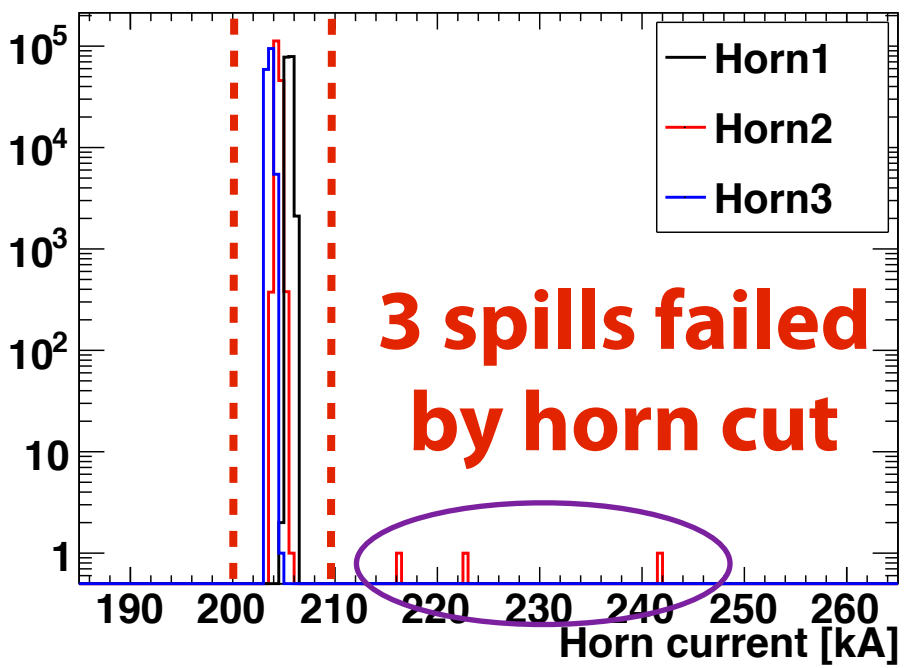


Horn2 current

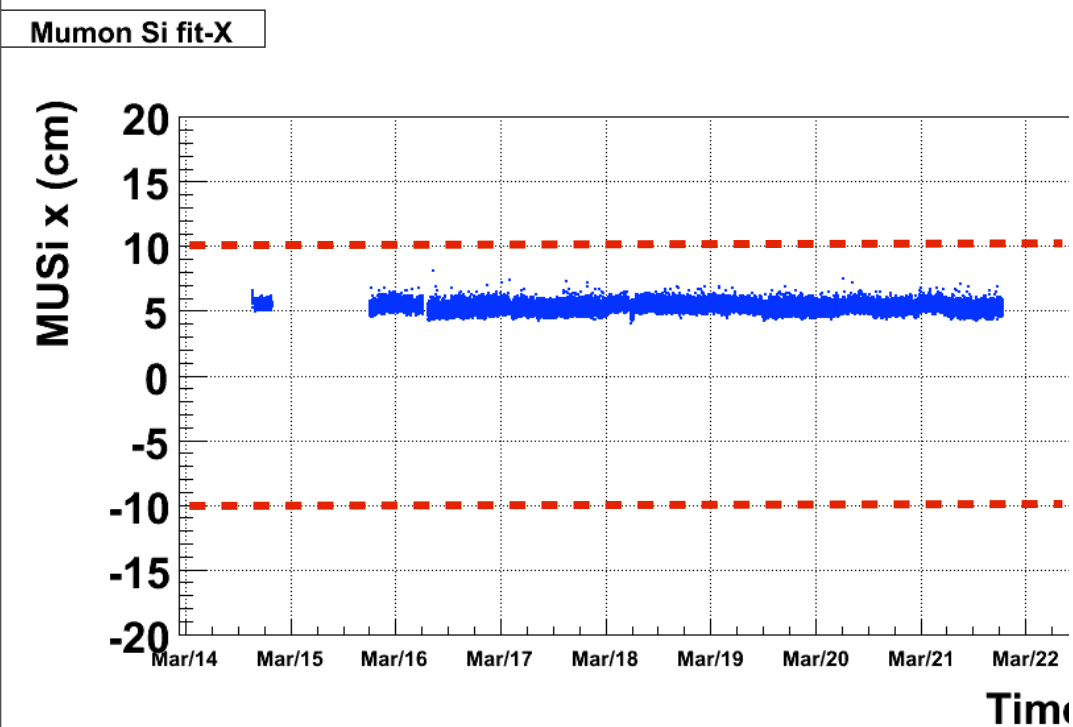


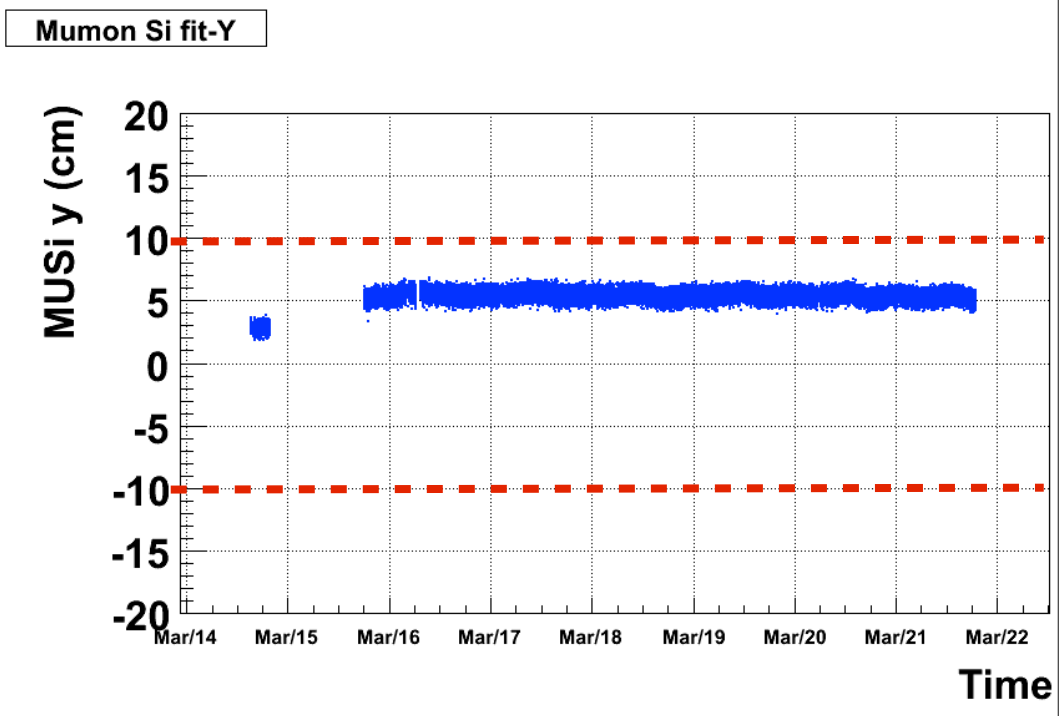
Horn3 current





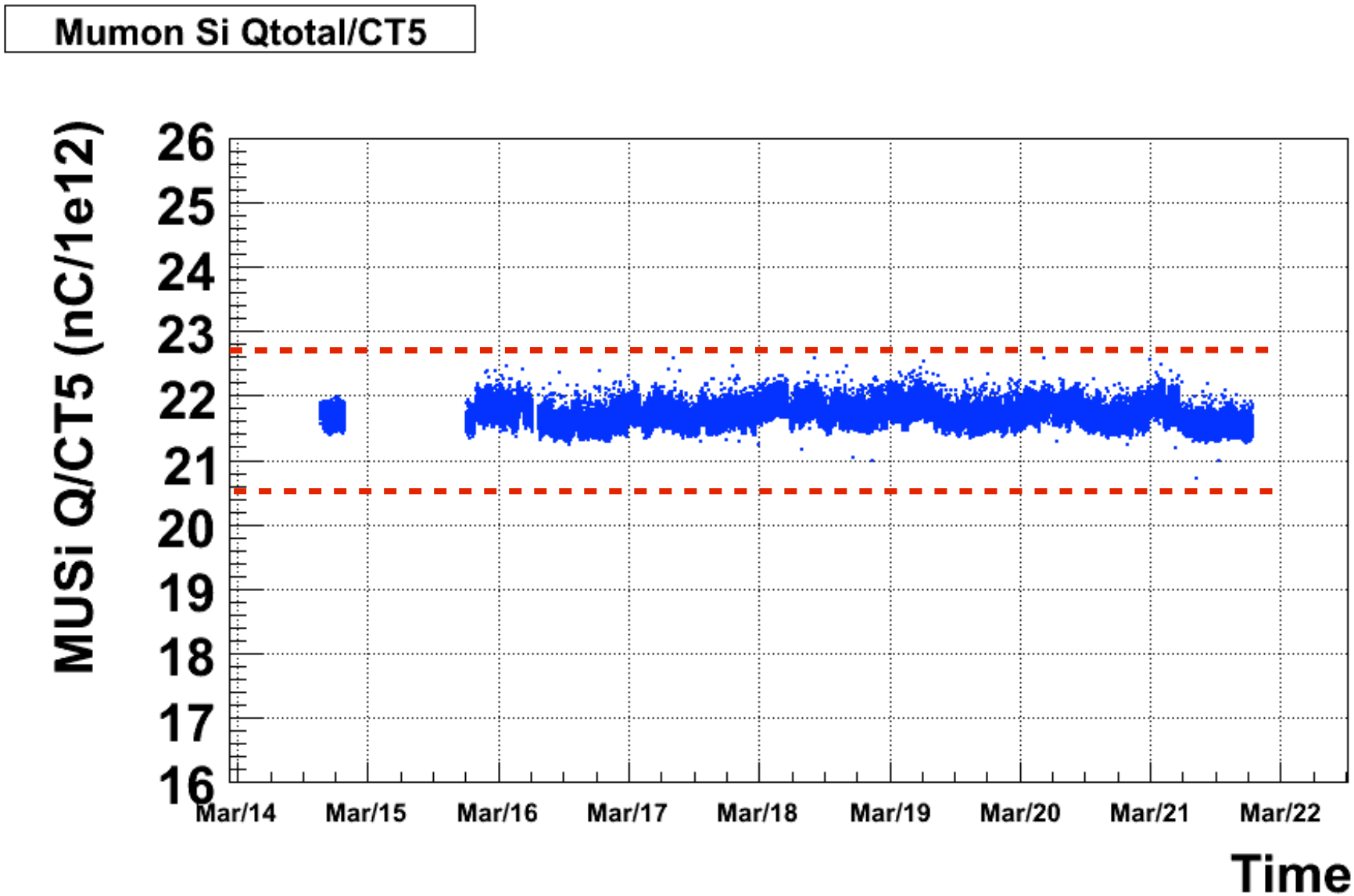
MUMON Si fit center





No Bad spill (not including horn bad spills)

MUMON Si Q / CT05



20.56
~22.73

No Bad spill (not including horn bad spills)

Good spill for physics runs

Run# 410138(3/14)~410208(3/22)

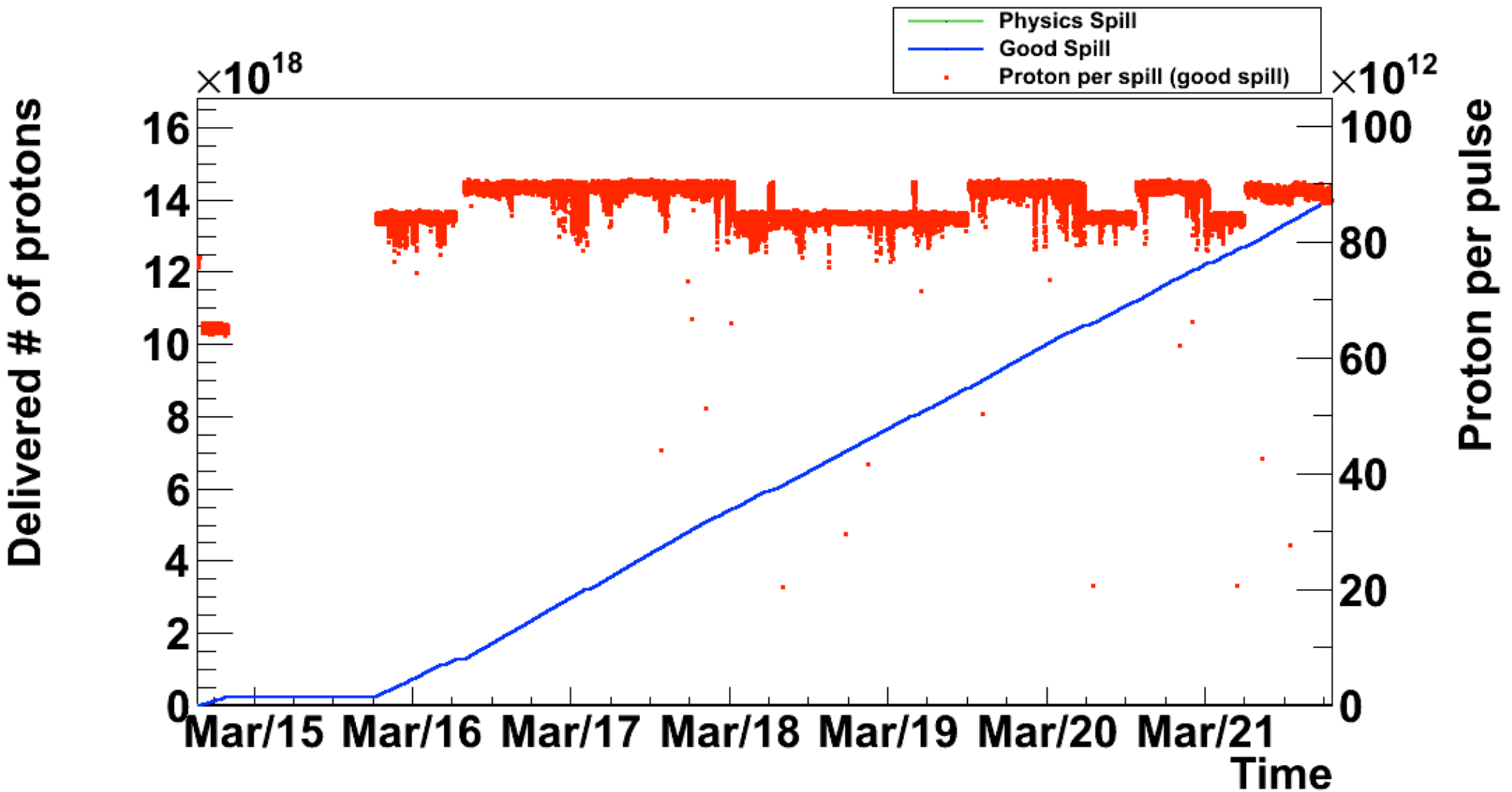
	# of spills	Ratio
Physics spills	162413	1
Beam trigger	161951	0.997
Good GPS	161951	0.997
ppp(CT5)>1e11	161838	0.996
Normal beam	161834	0.996
Horn cut	161831	0.996
MUMON cut	161831	0.996

# of delivered protons(CT5) after Good spill selection

Total POT : 1.400e18

Integrated POT (MR Run41)

Run# 410138(3/14)~410208(3/22)



Good spill for physics runs

All Physics run at horn 200kA (Run# 410074~410208)

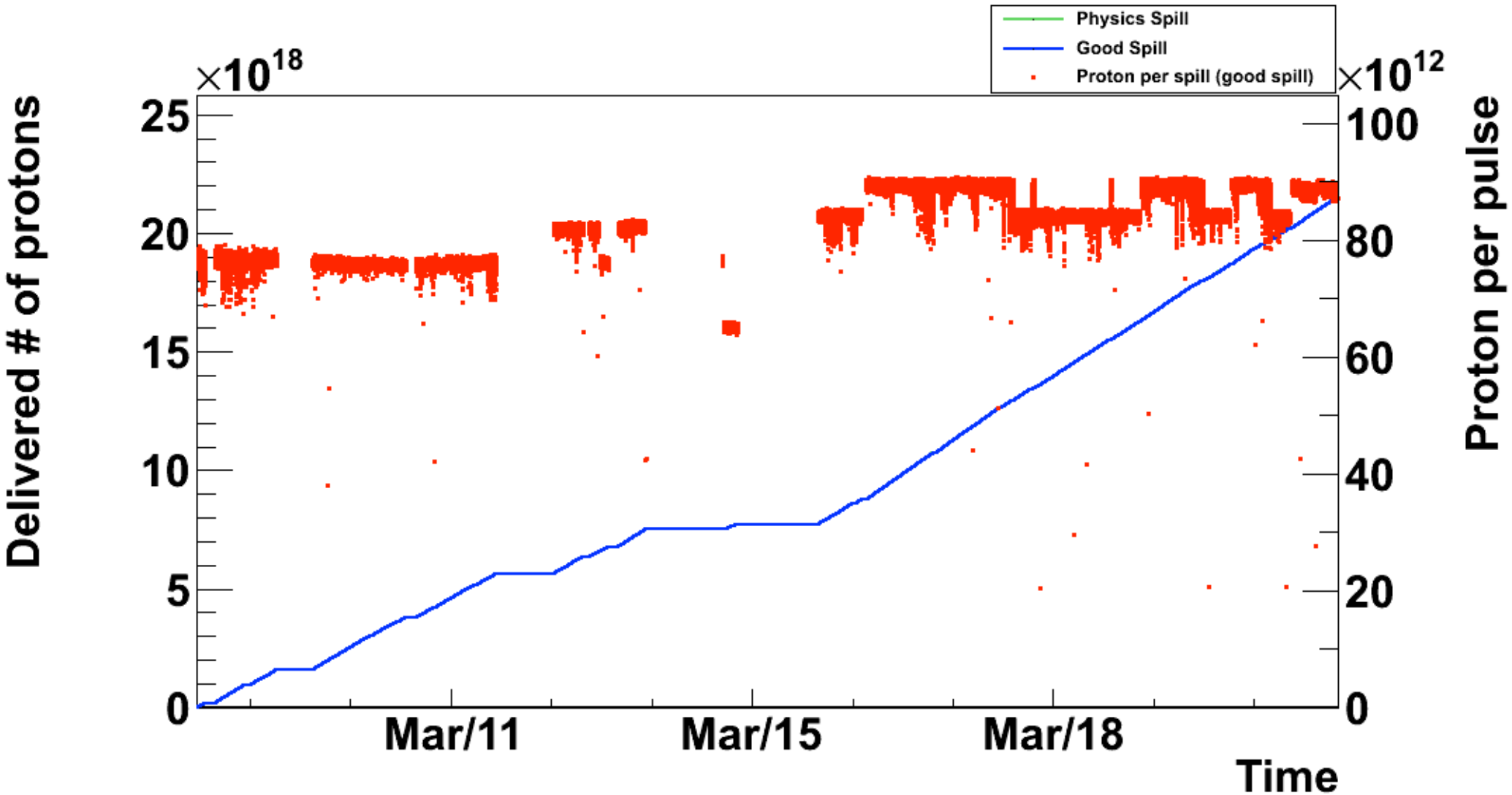
	# of spills	Ratio
Physics spills	259759	1
Beam trigger	258975	0.997
Good GPS	258975	0.997
ppp(CT5)>1e11	258802	0.996
Normal beam	258797	0.996
Horn cut	258794	0.996
MUMON cut	258794	0.996

# of delivered protons(CT5) after Good spill selection

Total POT : 2.151e19

Integrated POT (MR Run41)

All Physics run at horn 200kA
(Run# 410074~410208)



Definition of Good spill flag

- 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