RC report
November 12-19

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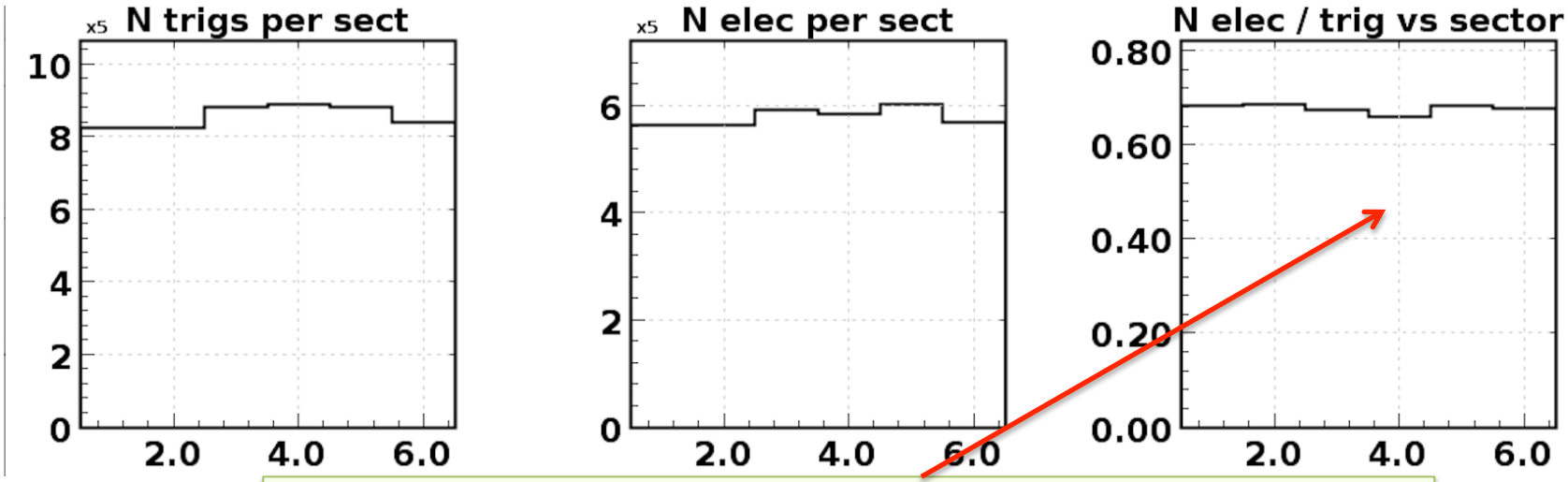
November 19, 2018

Run Group-A Sep26-Nov25

Electrons outbending, 10.6 GeV (Nov6-Now)

- Production − 40 nA (Nov 6-Nov 15)
  - Trigger purity = 68% in all 6 sectors
  - DC Occupancy outbend(R1=**2.9%**, R2=2.3,R3=2.3)
  - DC occupancy inbend (R1=**4.2%**, R2=2.2,R3=2.4)
- Production − 50 nA (25% increase, Nov 15 - Now)
  - Trigger purity = 65.5%, only 2.5% less than @40 nA
  - The DC tracking efficiency decreased by about 2% measured by number of additional TBT tracks
  - DC Occupancy outbend(R1=4.6, R2=2.3, R3=2.7)
  - DC Occupancy inbend (R1=4.6, R2=2.5,R3=2.6)
- Production current as for now = 50 nA

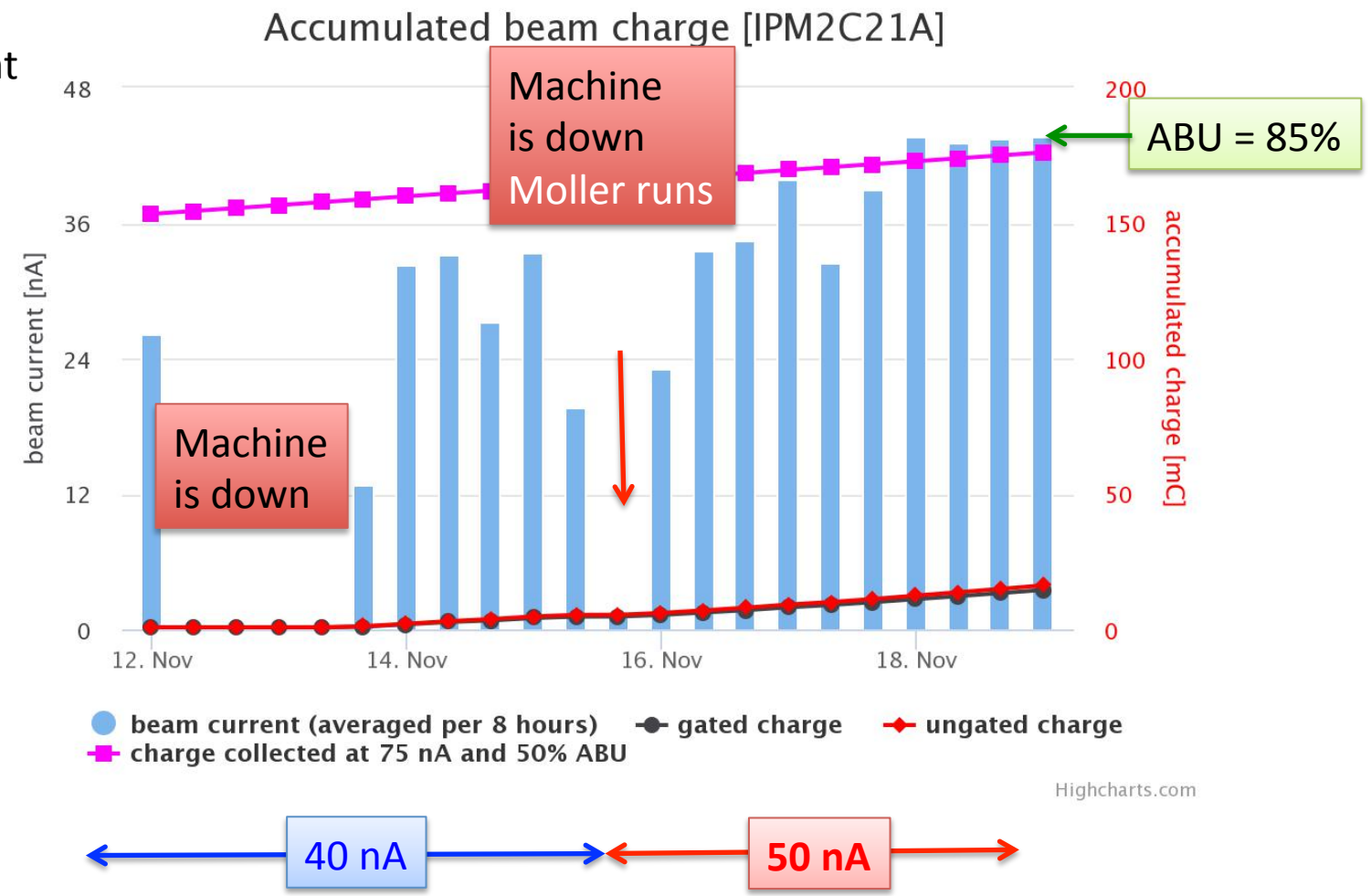
40nA Trigger Purity 68%



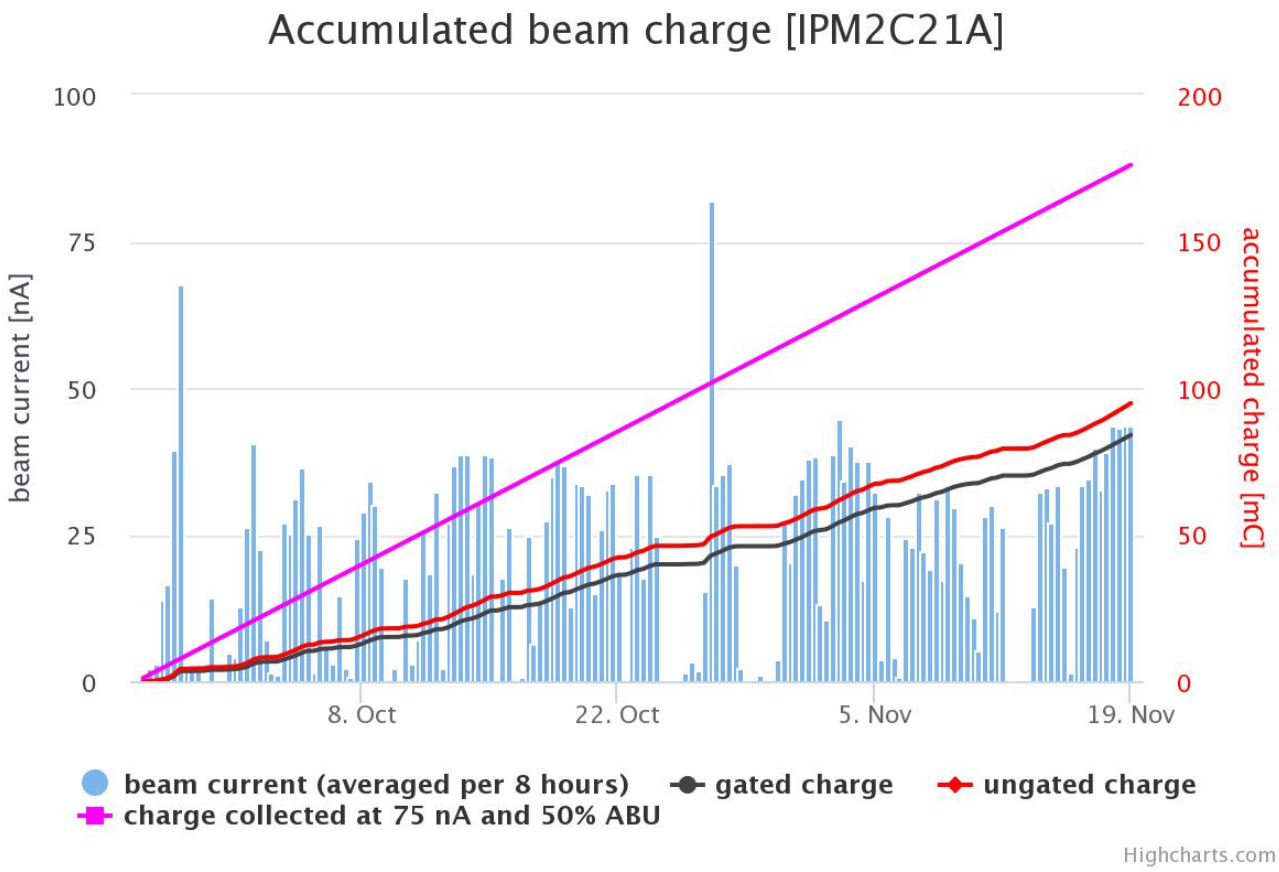
$$\text{Trigger purity} = \frac{\text{Number of off-line reconstructed electrons}}{\text{Number of trigger events}}$$

November 12-18

Beam current



Sep 26- Nov 18


Accumulated beam charge [IPM2C21A]
100
75
50
25
0
beam current [nA]
200
150
100
50
0
accumulated charge [mC]
8. Oct
22. Oct
5. Nov
19. Nov
beam current (averaged per 8 hours)
gated charge
ungated charge
charge collected at 75 nA and 50% ABU
Highcharts.com

The accelerator performance was extremely good this weekend

Owl shift summary

Lognumber 3627497. Submitted by rafopar on Sat, 11/17/2018 - 00:05.

Last updated on Sat, 11/17/2018 - 08:12

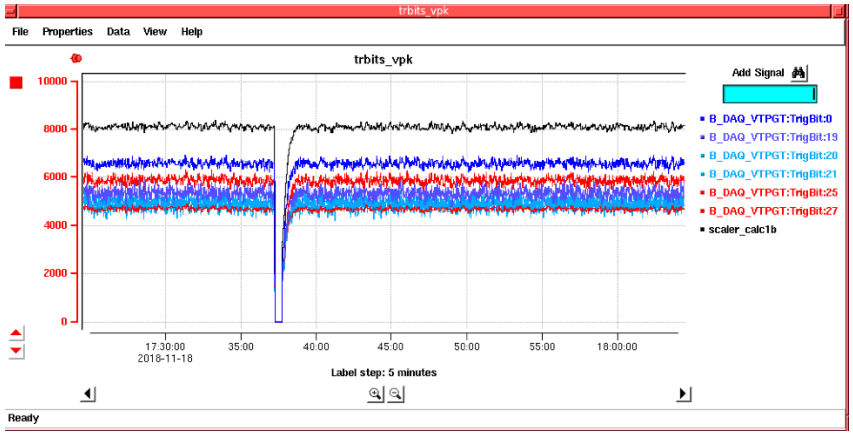
Logbooks:	HBLOG
Entry Makers:	lanza, rafopar

00:04 Continuing the Run 5526, currently 26M events.

01:37 Run 5526 ended with 100M events.

01:39 the Run 5527 has started.

03:40 The Run 5527 ended with 107 M events (wanted to wait for the beam trip to stop, but the beam doesn't want to trip :-))



One trip during 40 minutes !

CLAS12 performance
No problems to Report!

Owl shift summary

Lognumber 3628326. Submitted by battagli on Mon, 11/19/2018 - 00:08.

Last updated on Mon, 11/19/2018 - 08:06

Logbooks:	HBLOG
Tags:	ShiftSummary

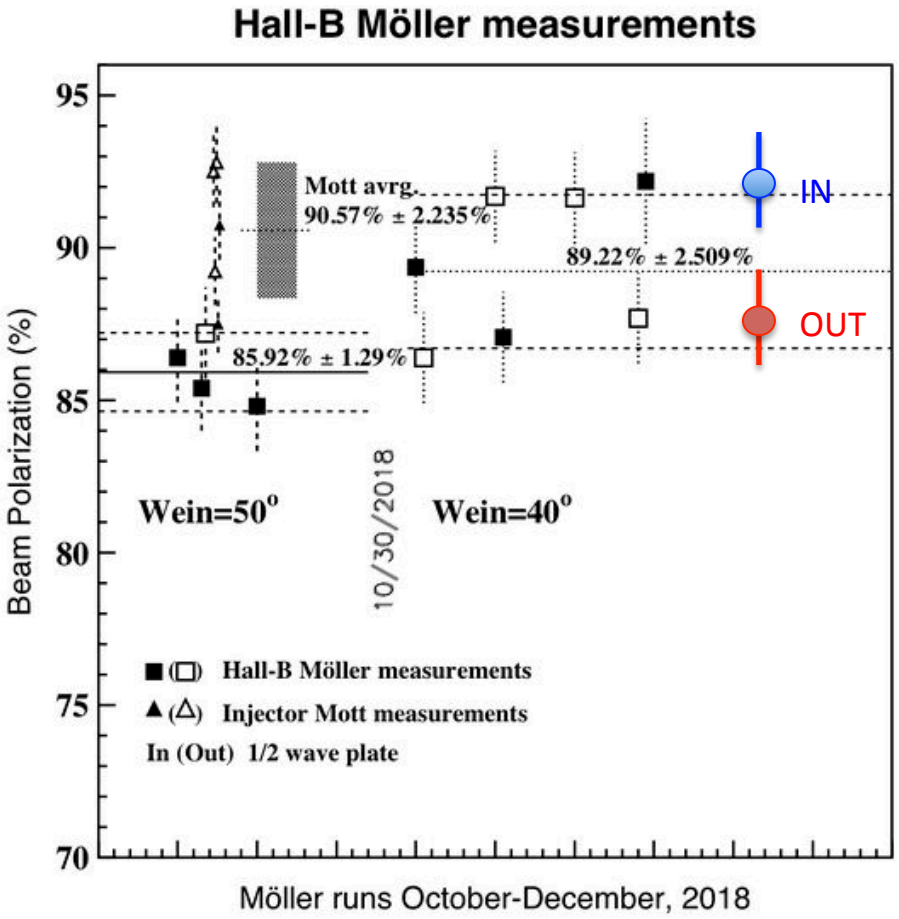
0:00 started shift with run 5555 at 40M
1:10 ended run 5555 with 100M
1:15 started run 5556
3:10 ended run 5556 113M
3:15 started run 5557
5:10 endedrun 5557 106M
5:15 started run 5558.
7:20 ended run 5558 with 100M
7:25 started run 5559
8:00 shift ends with 5559 running at 35M
(total events accumulated in the last 8h = 414M)

DAQ and Trigger @50 nA

- Trigger rate 18 kHz
- Data rate 420 MB/s
- Dead time 7%
- We still have room to go to 55 nA if we want to. We can return to this question after after off-line analysis of the 50 nA runs will be done.

Moller Run (Nov 15)

- Half plate OUT = +87.55 +/- 1.5
- Half plate IN = -92.18 +/- 2.0



Special Runs

- Run Group A will take data up to November 26th without interruption even on Thanksgiving day
- Empty target run
- 5 nA beam current (1 shift)

Preparation for the coming RG-K run

Nov29-Dec19, 2018

- Beam energy 7.5 GeV (Nov29-Dec09)
- Beam Energy 6.5 GeV (Dec13-Dec19)

Run Group K Triggers Configuration E=7.5 GeV

Trigger Number	Physics Definition	Detectors Conditions	Thresholds	prescale
0	1 electron in CLAS All sectors − with DC	(DC x HTTC x ECAL x PCAL) or (DC x HTTC x PCAL)	(PCAL+ECAL)> 300 MeV PCAL>60 MeV ECAL>10 MeV or PCAL> 300 MeV	1
1-6	1 electron in CLAS Fixed Sector − with DC	(DC x HTTC x ECAL x PCAL) or (DC x HTTC x PCAL)	(PCAL+ECAL)> 300 MeV PCAL>60 MeV ECAL>10 MeV or PCAL> 300 MeV	1
28 (new)	Forward electron 1 forward and 1 central	FT (1800-6600) x DC x FTOFPCU x PCAL x CTOF X CND	PCAL>15 MeV CTOF vs CND map no additional threshold	1
24	Forward electron 1 forward and 1 central	FT (1800-6600) x DC x FTOFPCU x PCAL x CTOF	PCAL>15 MeV CTOF clusters>2 MeV	1
25	Forward electron 2 forward	FT (1800-6600) x (DC x FTOFPCU x PCAL x CTOF)^2	PCAL>15 MeV	1

New RG-K triggers

- TR#24 [FT*FD*CTOF(clusters)]
- TR#28 (FT*FD*CTOF(clusters)*CND(clusters)]
- Will be ready today
- Plan to take validation data on Tuesday morning

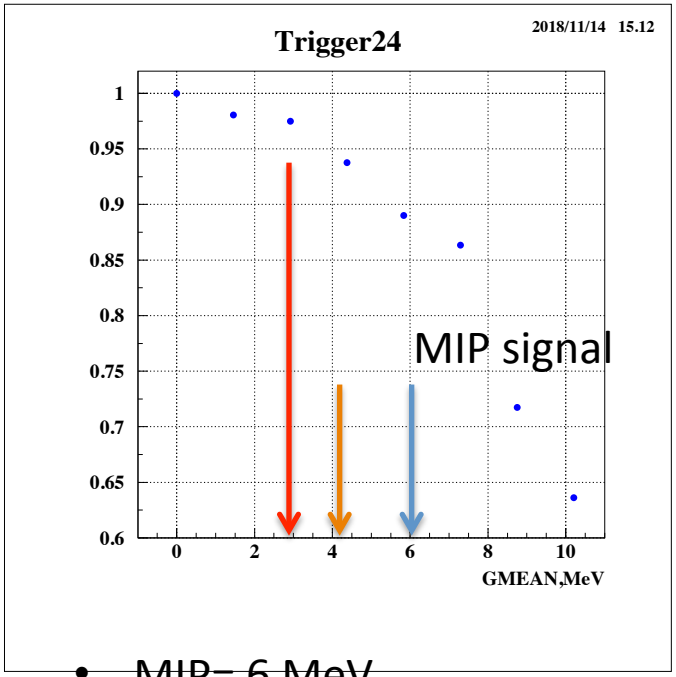
Trigger Rates

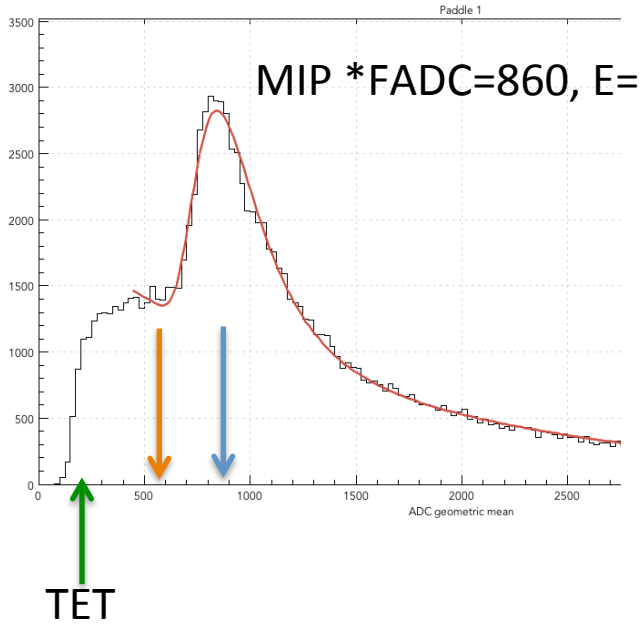
Date	Run	Energy	Torus	I nA	Electron #0	FT*FD^2 #25	FT*FD*CTOF #24
10/31/18	5339	10.6	Inbend(-1)	40	2.9 kHz	4.3 kHz	10.7 kHz
11/07/18	5429	10.6	Outbend(+1)	40	7.6 kHz	4.2 kHz	10.6 kHz
02/07/18	3065	6.4	inbend	16	5.4 kHz	9.2 kHz	17.1 kHz
04/04/18	3842	6.4	outbend	20	11.2 kHz	0.6 kHz	4.0 kHz

- It looks like we will saturate DAQ at 25-30 nA (L=0.25 10^35)
- The beam current and trigger parameters have tol be optimized to reach maximum luminosity

The End

Trigger #24 Rate as a Function of CTOF Threshold





- ~~MIP= 6 MeV~~
- Maximum cut = 4 MeV
- Practical cut =3 MeV taking into account non-ideal calibration
- It means that we can gain 3% in trigger rate without clustering and even less when we will implement clustering
- Lower the cut to 2 MeV (it is minimum from TET=48=1 MeV) will get 100% efficiency even without clustering