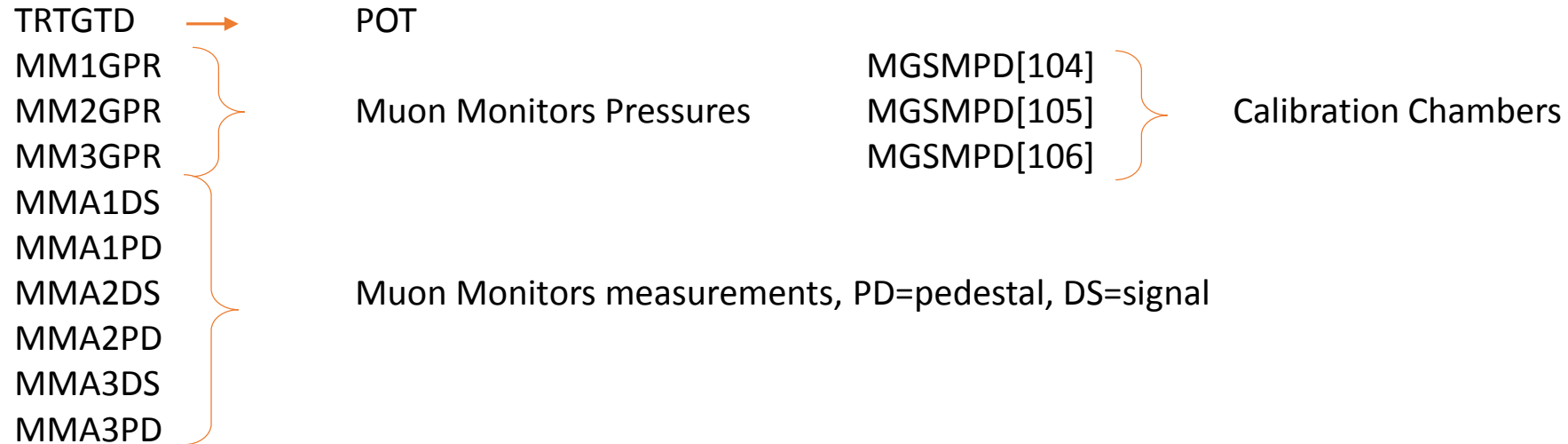


Muon Monitors

- In order to monitor the stability of the muon monitors signal in time I use the data taken from the IF Database, (some of) the devices logged in the bundle are:



- The MM signal (sum over all the chambers) is POT normalized and corrected for the pedestals, it has to be further corrected for the gas pressure
 - One could use the GPR readings to calculate the pressure correction, however **from May 2015** the calibration chambers are also logged in the IFDB and it's easier and faster to use those values
- We retrieved the calibration chambers data for few 2-weeks periods before May 2015 from ACNET (thanks to A. Marchionni!) in order to analyse the MM data in the same way for 2014 and 2015

→ **Data for Nov2014, Jan2015, Mar2015, May/June2015, Oct/Nov2015**

Muon Monitors

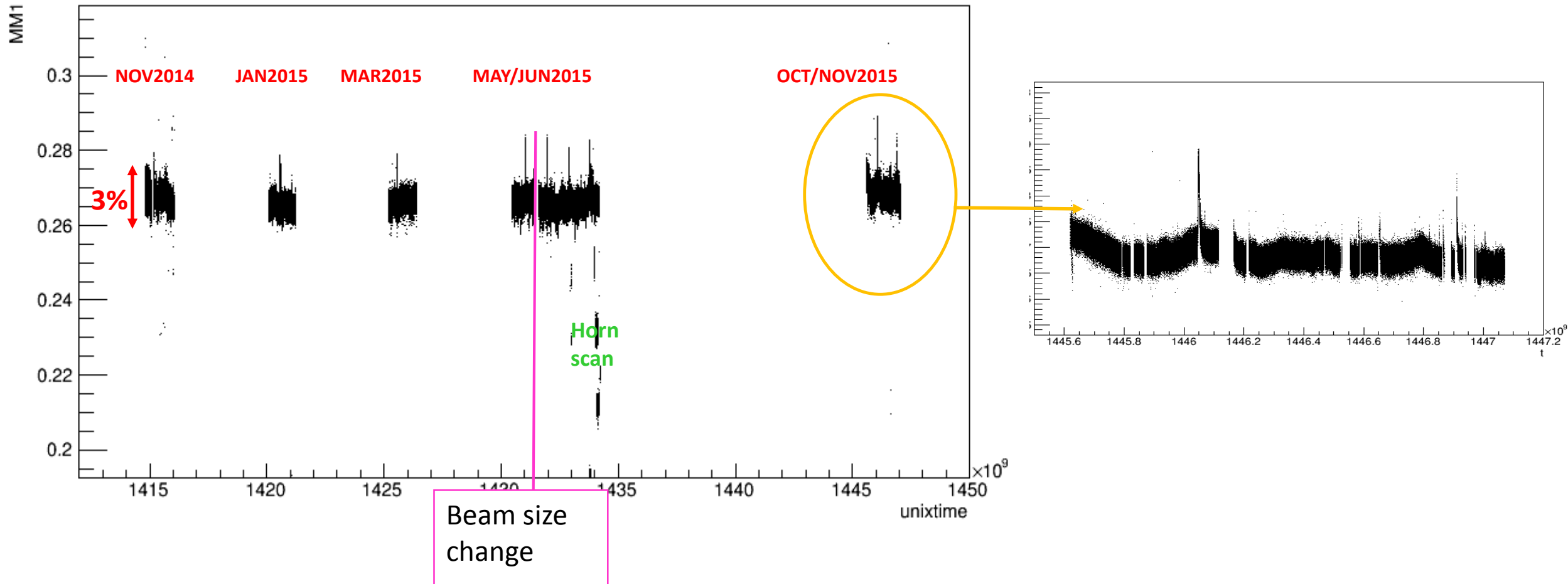
- In what follows the idea is to check the overall stability of the MM chambers over a long period of time

The signal was also analysed for continuous periods, for example before the beam spot size change Nov2014→14May2015 (and the pressure corrections is calculated using the GPR monitors...), but there are some older presentations about that

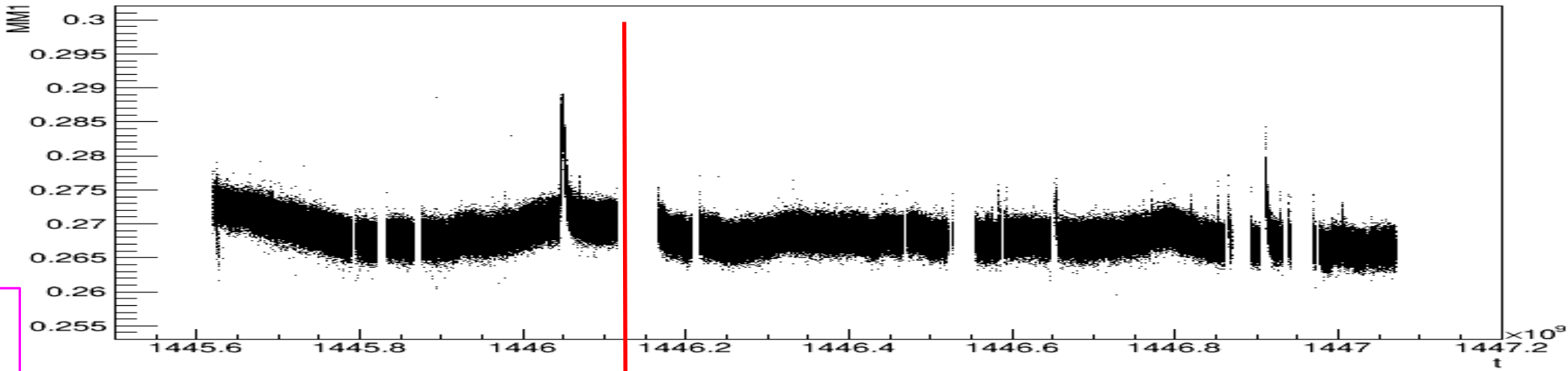
- We can make a
 - Comparison of the signal before and after the beam size change
 - Comparison between First Run/Second Run (the horn1 has changed, new beam alignment to the center of the hadron monitor)
- Reminder:
 - MM1**: gets more flux but in order to avoid saturation the electronics is 10 times less sensitive
 - MM2**: probably the best one to monitor the ME beam
 - MM3**: low flux, muons above ~20GeV

Muon Monitor1

MM1 POT Norm, PED&PRESS corr

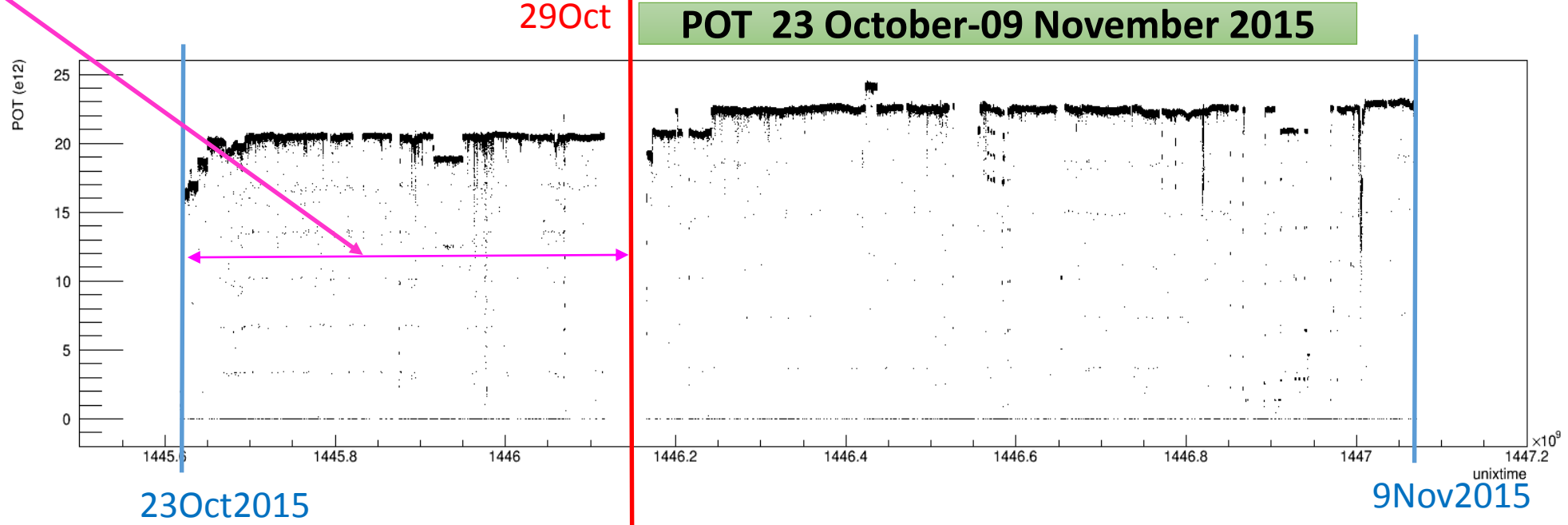


MM1 23 October-09 November 2015



I won't use this period when checking the stability of the mean MM values over time ...see next slide...

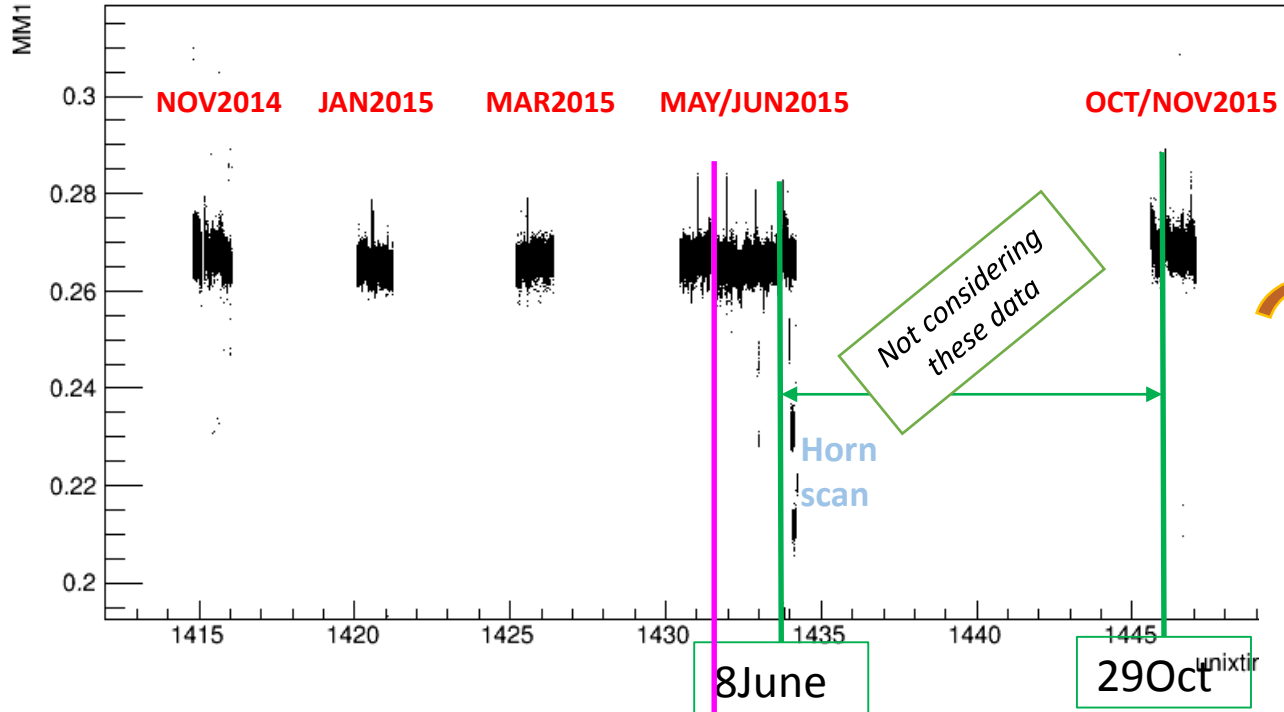
POT 23 October-09 November 2015



23Oct2015

9Nov2015

MM1 POT Norm, PED&PRESS corr



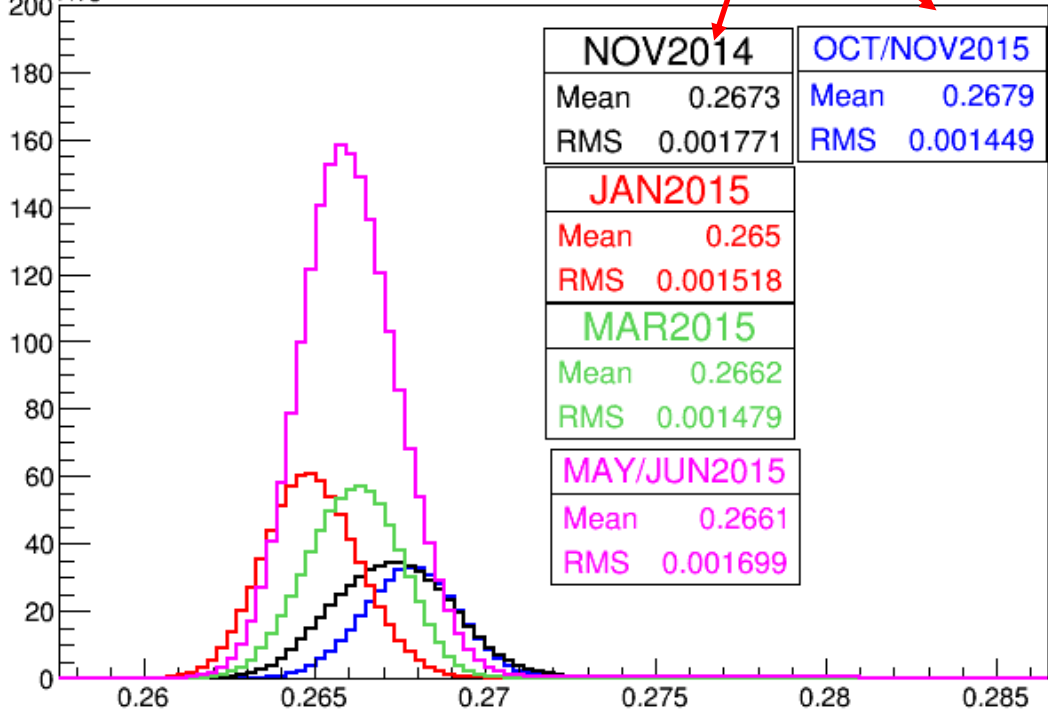
Beam Size change
14 May

Not considering these data

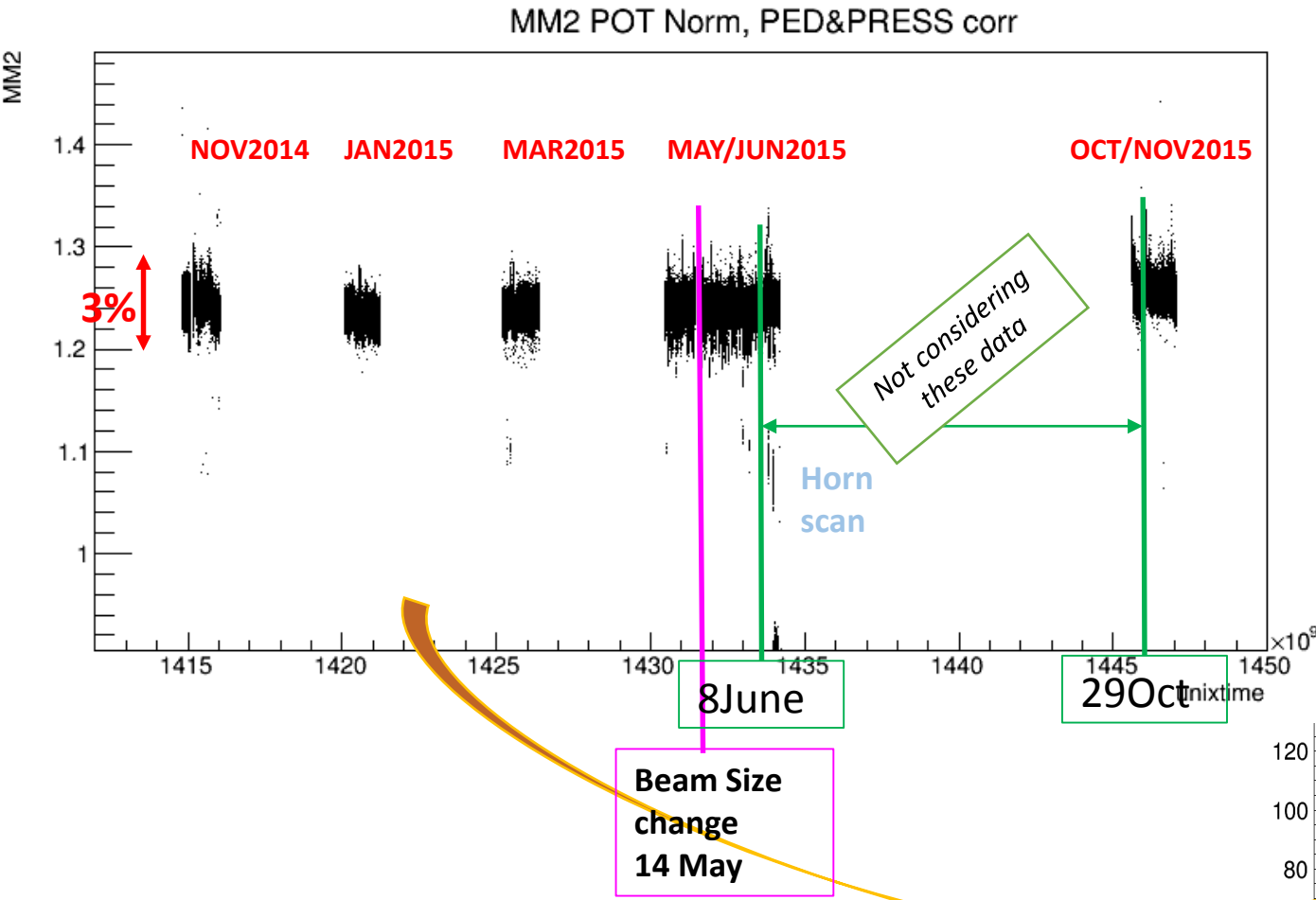
Muon Monitor1 Mean Values

The mean value for MM1 in Oct/Nov2015 has increased by 0.6% w.r.t the first run

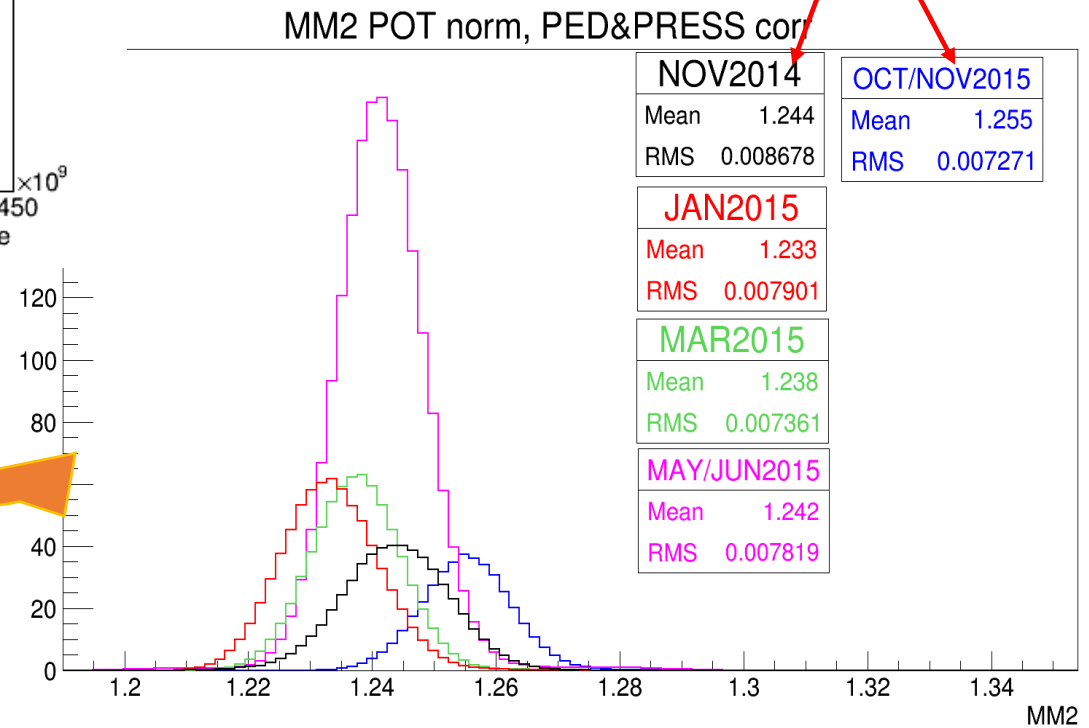
MM1 POT norm, PED&PRESS corr

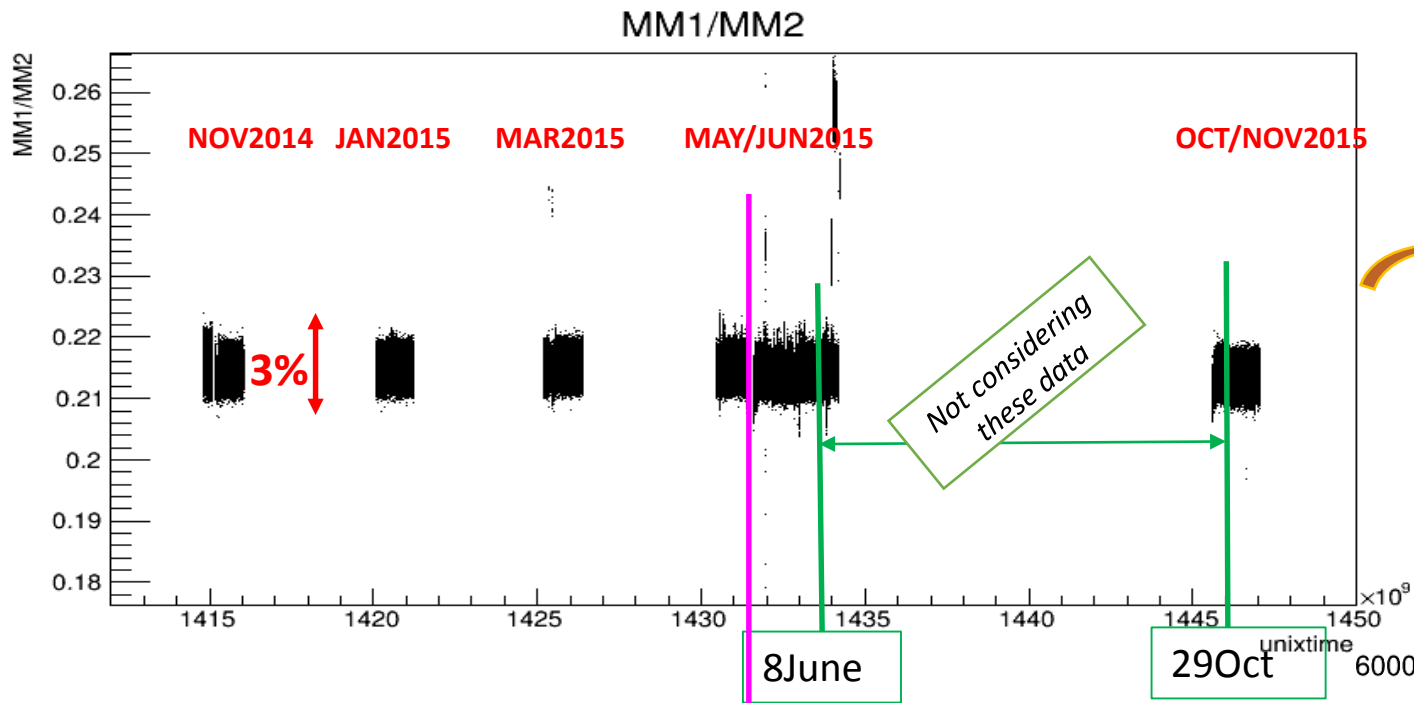


Muon Monitor2



The mean value for MM1 in Oct/Nov2015 has increased by 1.5% w.r.t the first run



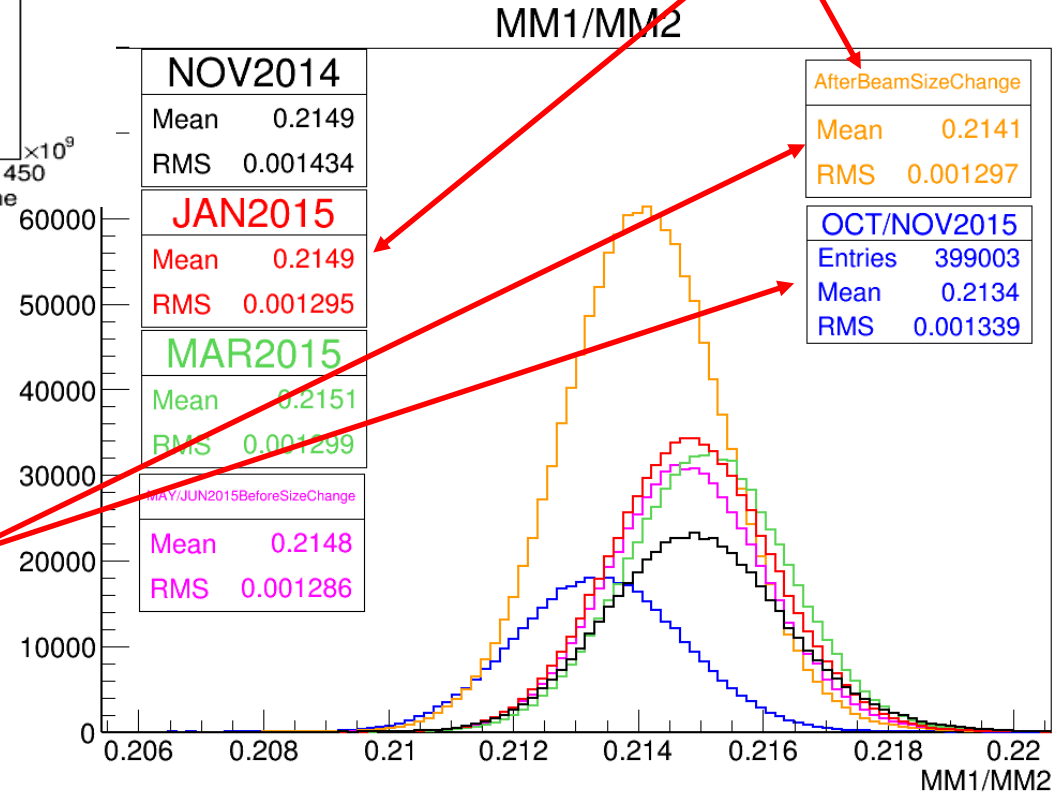


Ratio Muon Monitor1/Muon Monitor 2

Check the effect
before/after the beam size
change (see next slide)

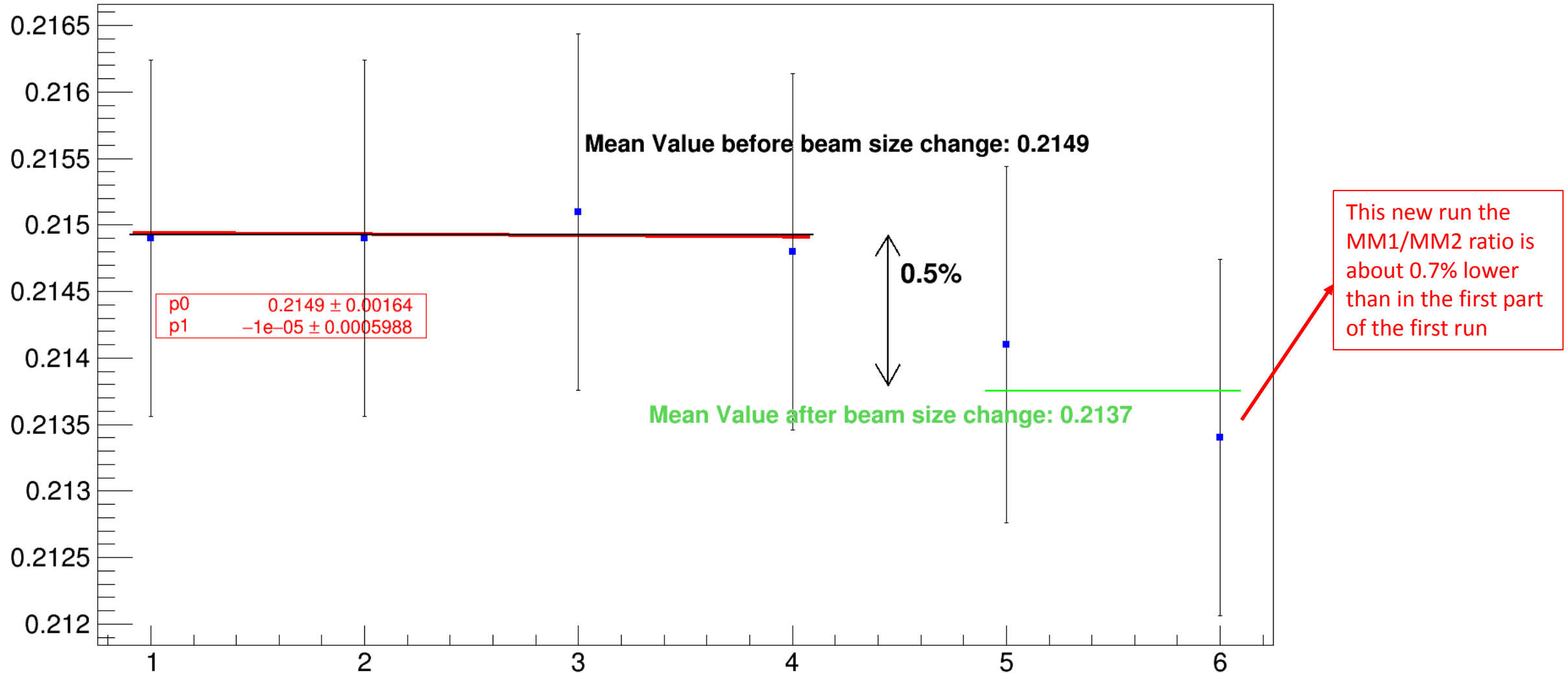
Beam Size change
14 May

Check the stability
end of first run – beginning of second run
→ Ratio decreases by 0.3%



Ratio Muon Monitor1/Muon Monitor 2 – Mean values

MM1/MM2 Mean Values



Muon Monitors – Summary

Check on the stability of the MM signal in time:

-The signal of the Muon Monitors is very stable in time

→ the MM1, MM2 signal and the MM1/MM2 ratio from November 2014 to November 2015 have **variations of the order of 1%**

-Before/after beam size change → the effect is small **~0.5% decrease in the MM1/MM2 ratio**

-Comparison First Run/Second Run:

-The Horn1 has changed

-New beam alignment to the center of the Hadron Monitor

→ There's a small increase in the signal, about **+0.6%** for the **MM1**, about **+1.5%** for the **MM2**, and about **-0.7% in the MM1/MM2 ratio** if we compare with the beginning of the first run, **but the variation is much smaller if we consider the end of the first run** (after the beam size change): **0.3%** variation

- To monitor the stability of the Muon Monitor during this run and to compare with the past I'll have to process more data (but so far everything looks fine...)