

# Status of the TRIUMF beam test

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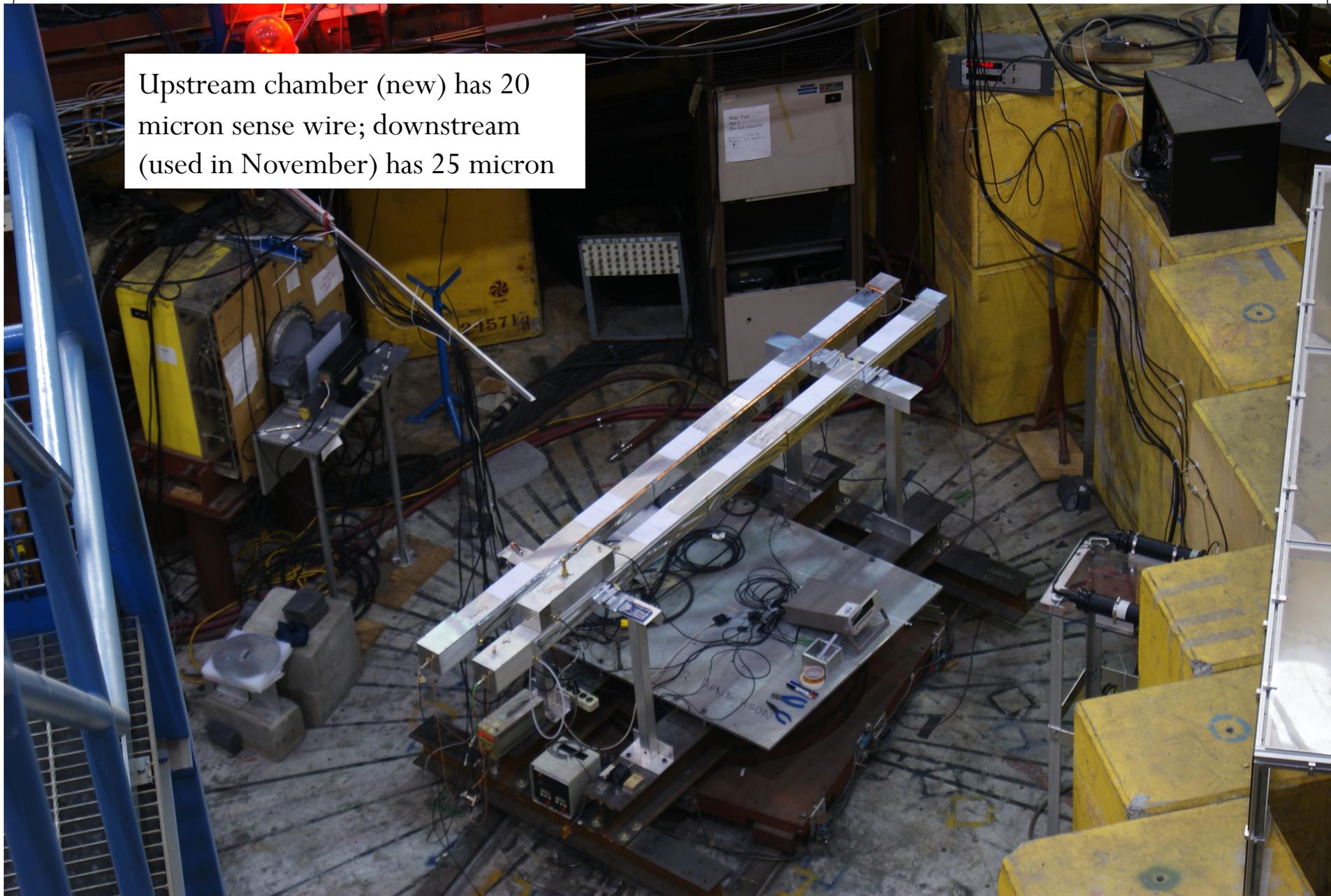
# Goals

- Establish whether or not amplifier prototypes provided by Jean-Pierre satisfy the requirements for cluster counting.
- Quantify the benefits of cluster counting wrt  $dE/dx$
- Impact of sense wire diameter on PID performance
- Impact of analog cable choice on PID performance
- Impact of cable connectors on PID performance
- Impact of termination on PID performance
- Impact of gain on PID performance
- Normalization of current draw for aging calculations
- $dE/dx$  data for Rocky's thesis

# Implementation

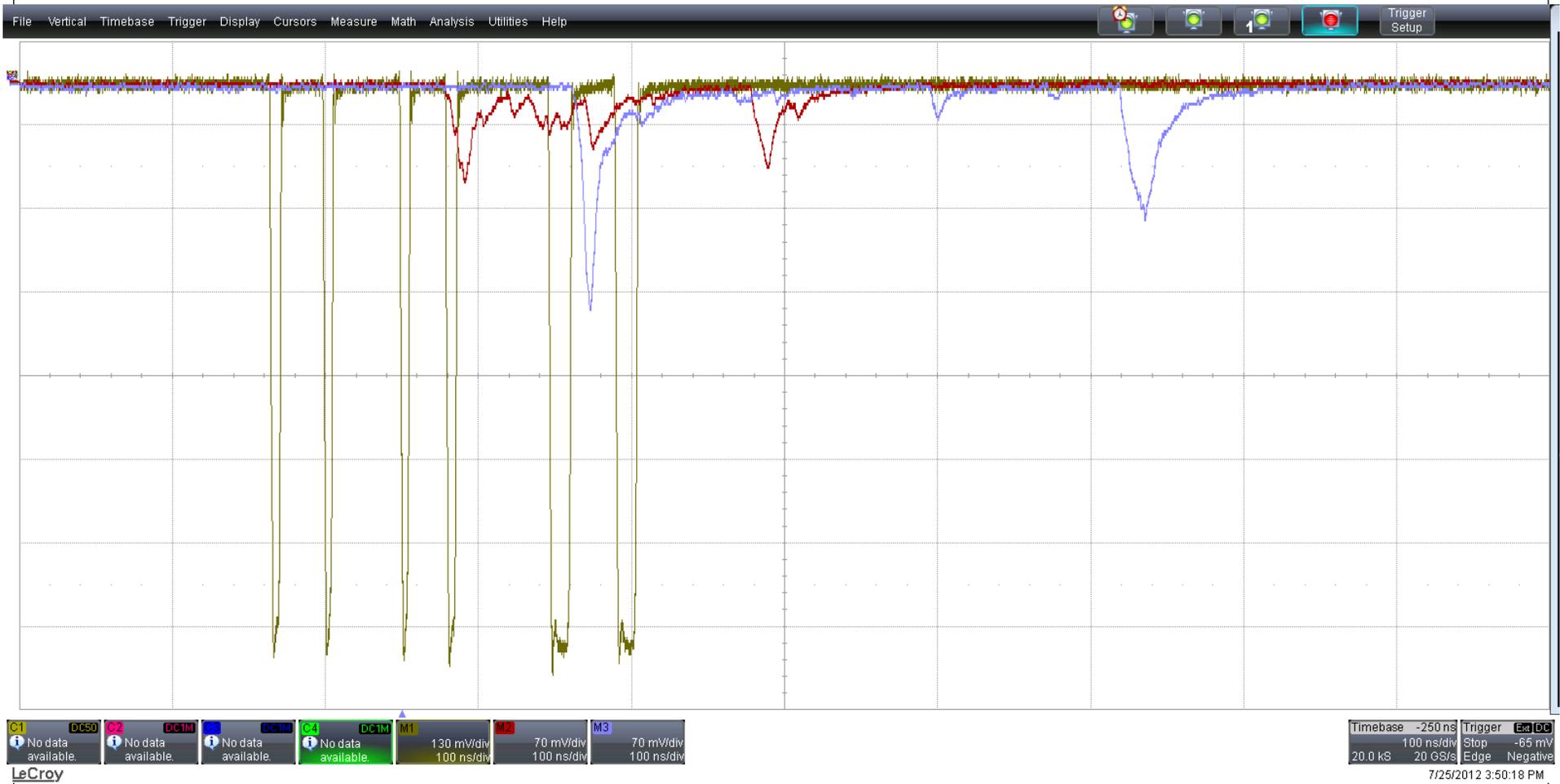
- Three single-wire chambers with 20, 25, and 30  $\mu\text{m}$  gold-coated Moly sense wires.
- Three different amplifier prototypes (three copies of each)
- Use 4 GHz bandwidth scope for DAQ
  - three channels for the chambers plus one for the TOF system
- Move Rocky's monitoring chamber to M11 to correct for pressure and temperature. Separate DAQ.
- Add third trigger counter to clean up triggers
- Add random trigger

Upstream chamber (new) has 20  
micron sense wire; downstream  
(used in November) has 25 micron



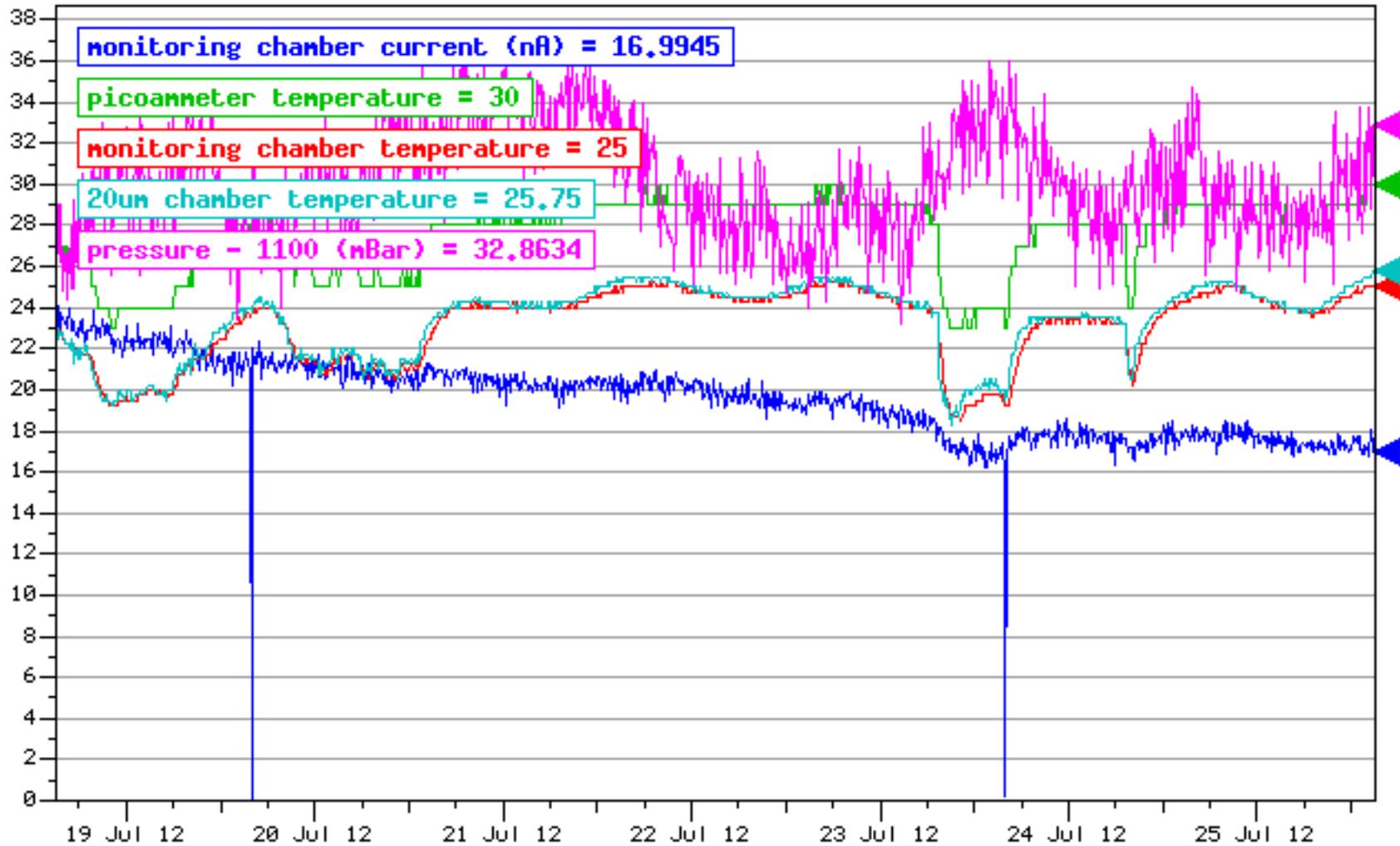


4 GHz 40 GS/s LeCroy scope for readout. Four time-of-flight signals, plus beam pick off, are put onto trace 1. Other three traces are for three chambers. (Third chamber is not ready).

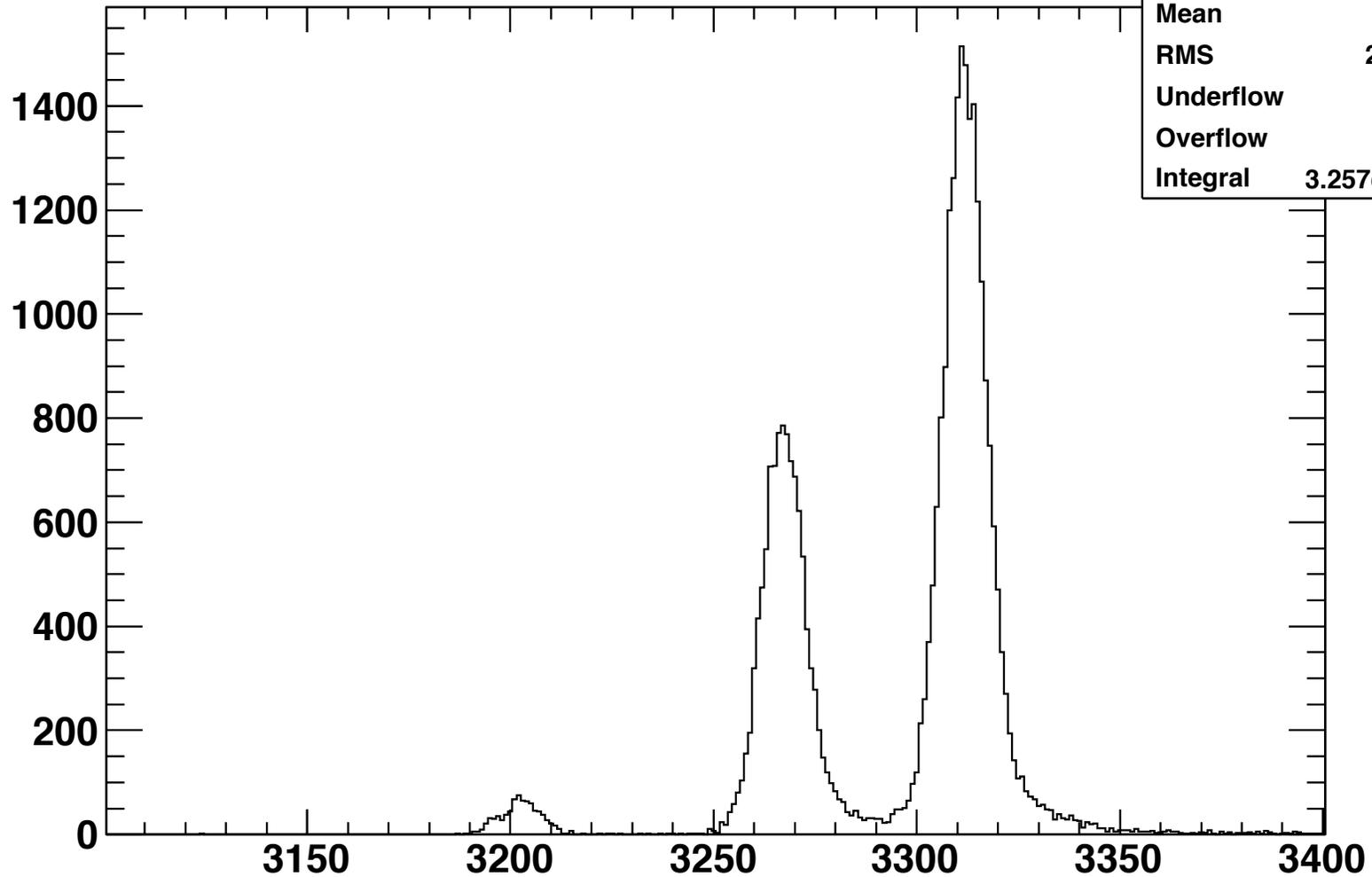


MIDAS used for monitoring pressure, temperatures, and monitoring chamber current. Monitoring chamber appears to be dying

### Default/slowControl

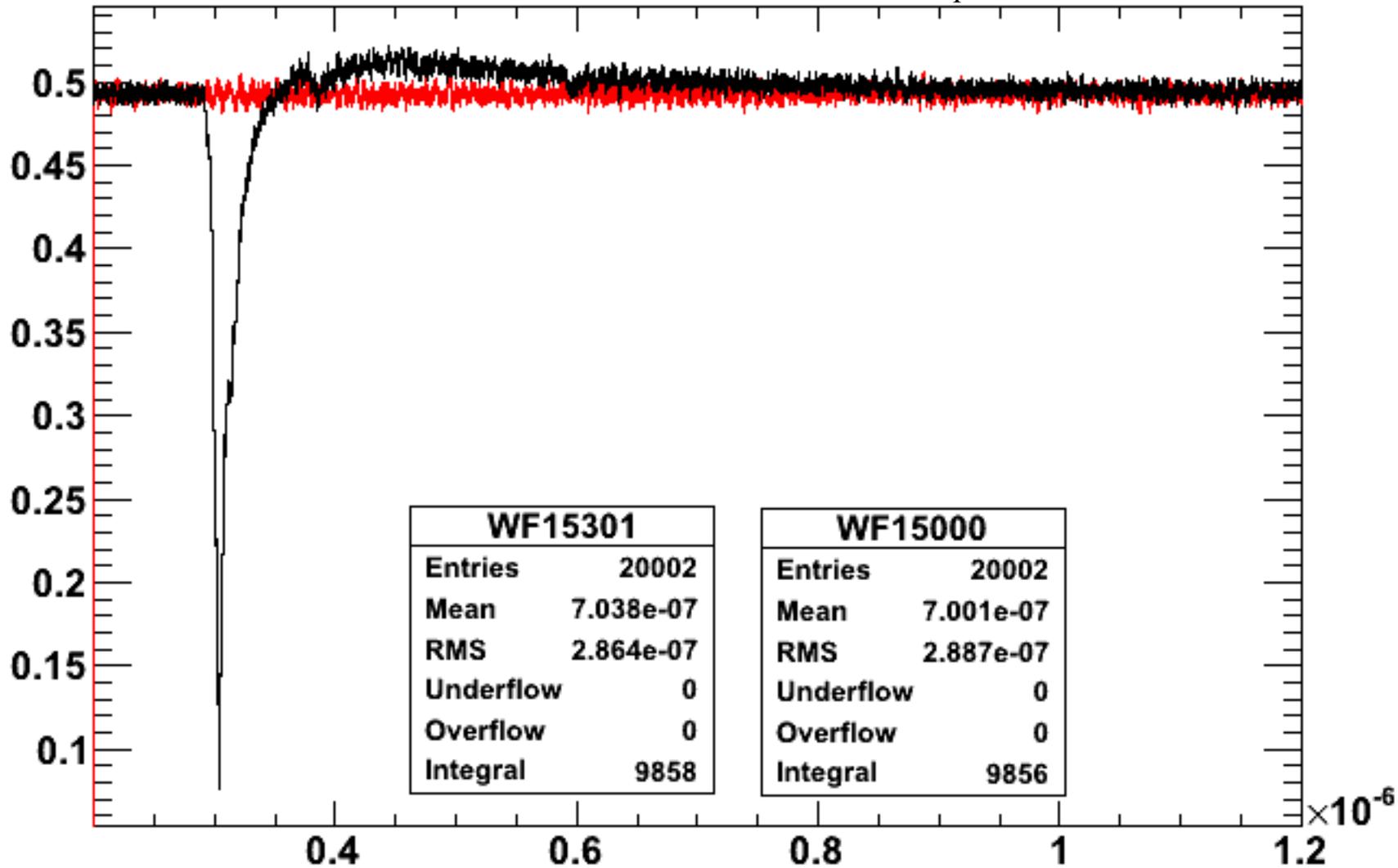


Almost all of our data will be at 210 MeV/c. Time of flight seems to be working quite well.



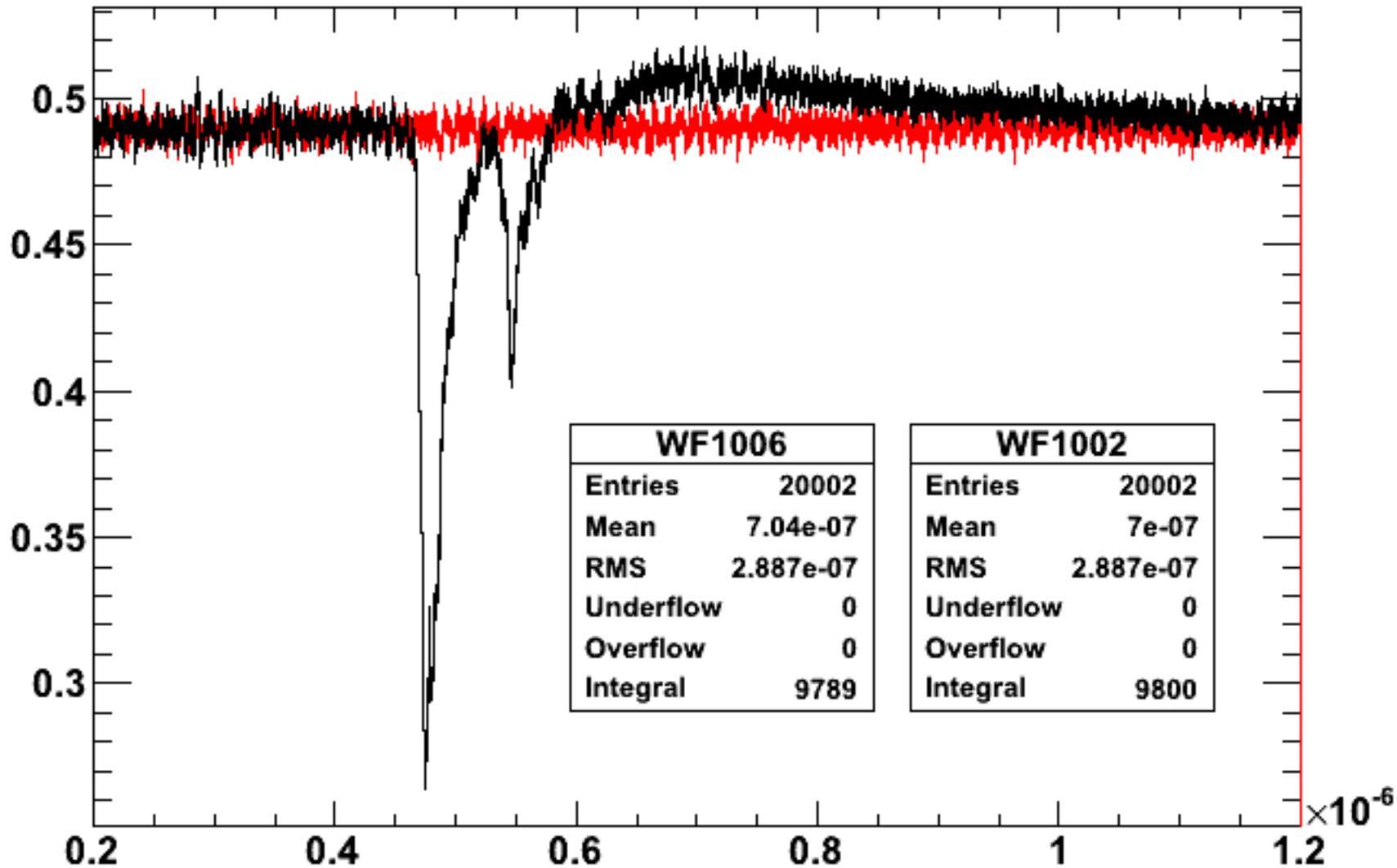
Run300 25 micron 180 ohm 210 MeV/c

180 ohm amp initially showed significant overshoot. Also possible oscillation.



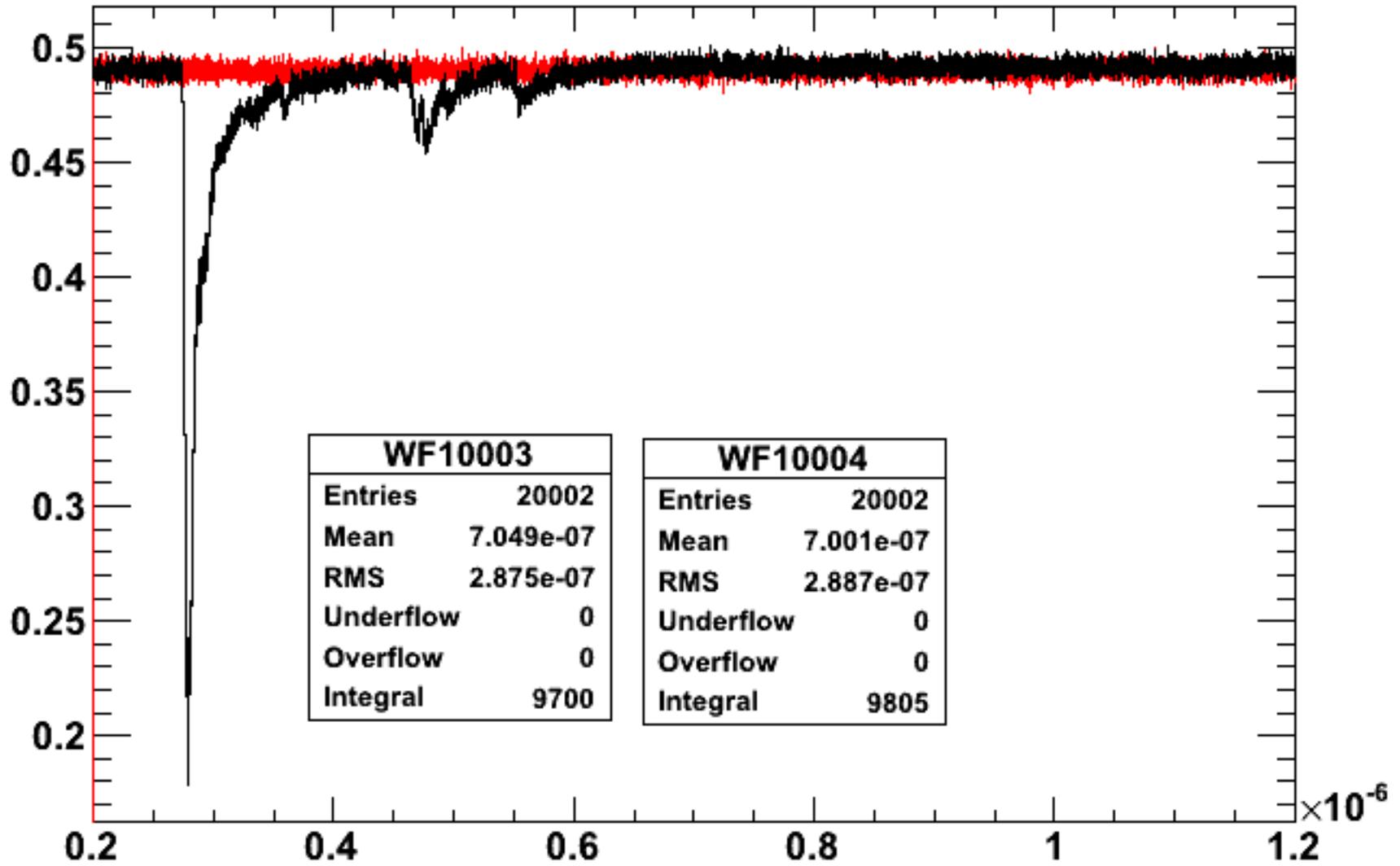
Run317 25 micron 370 Ohm 210 MeV/c

so did the 370 ohm one. We shipped these back to JP for modification.

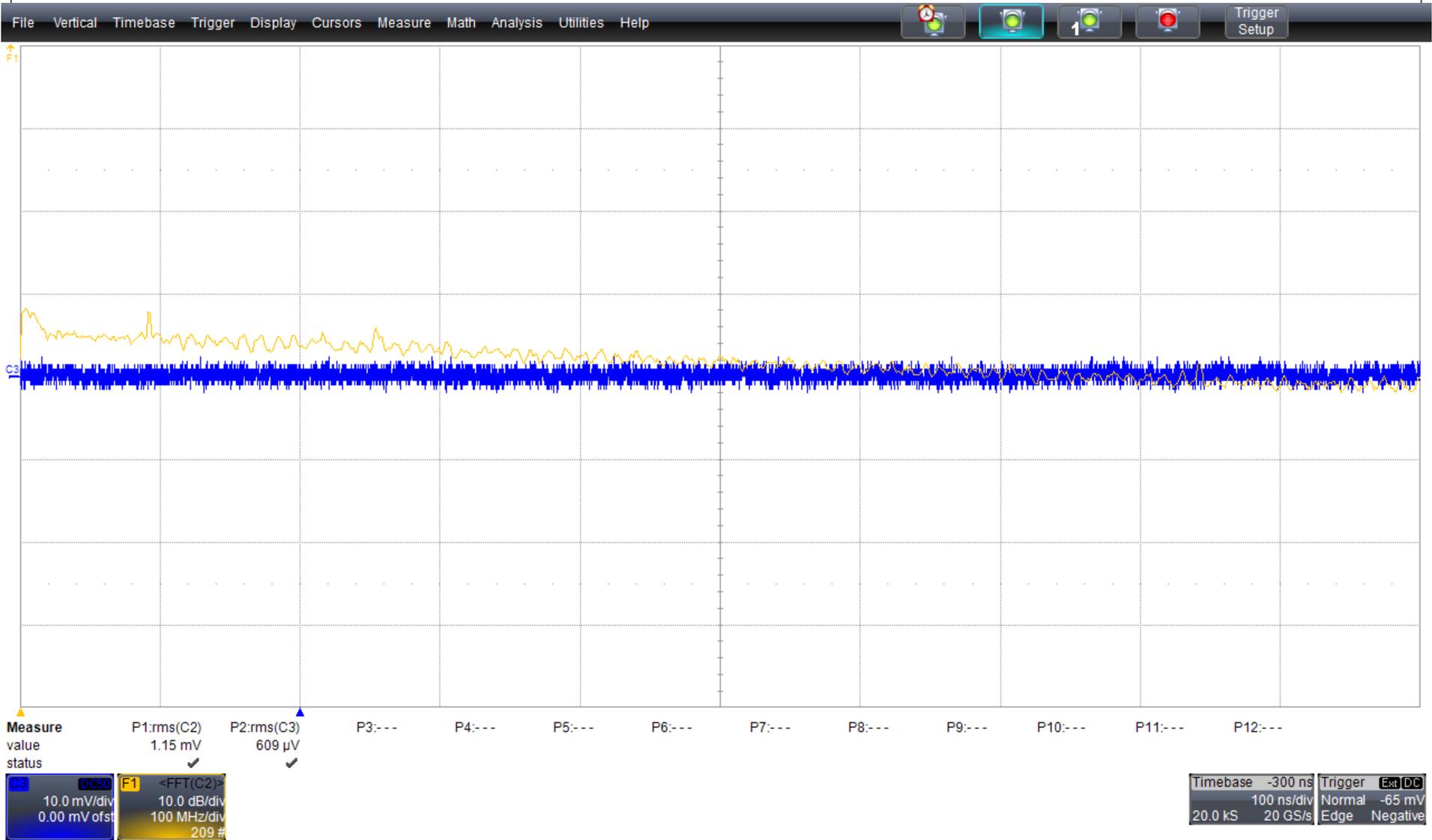


Run316 25 micron 50 ohm 210 Mev/c

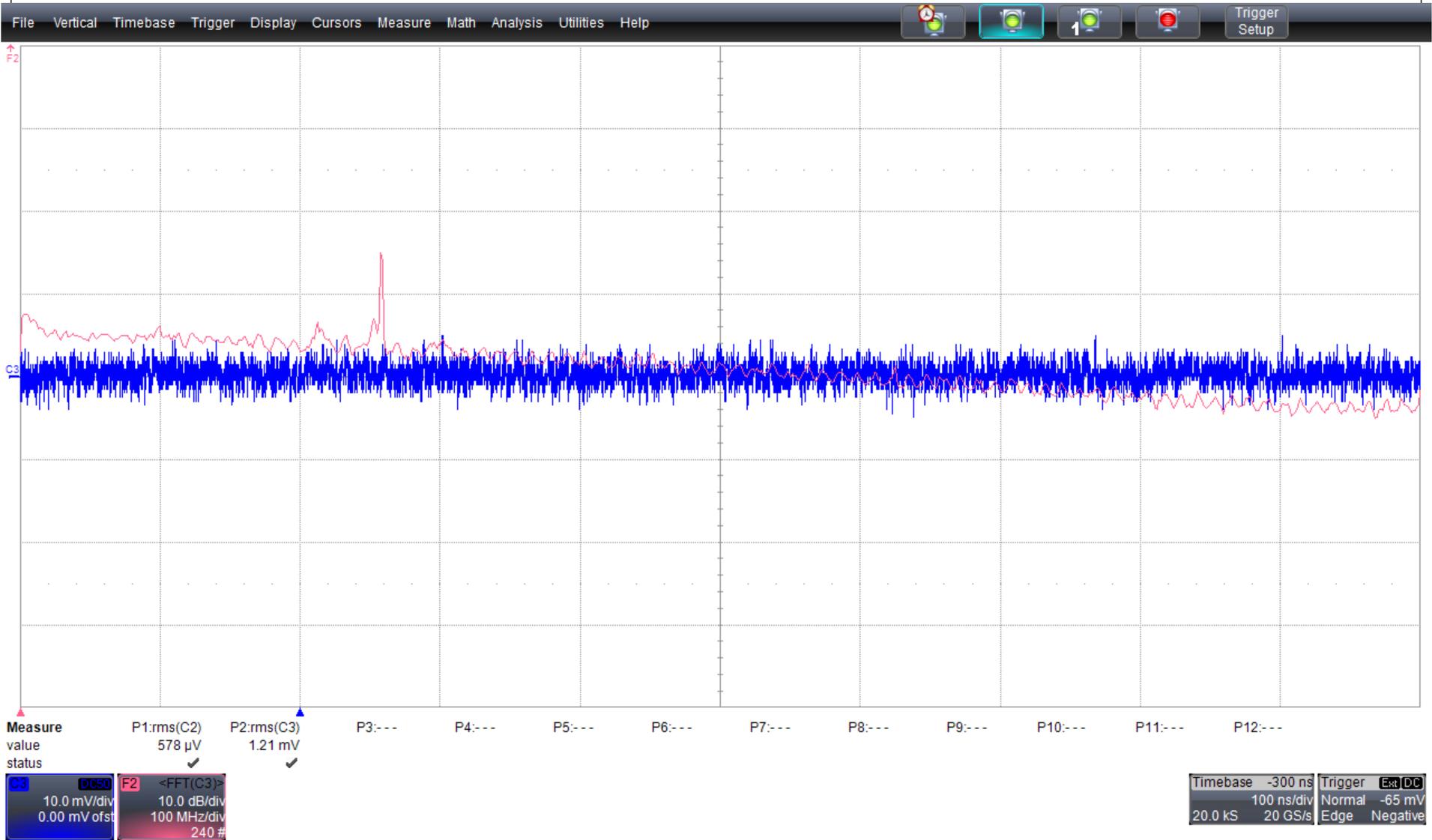
50 ohm amp looks quite good



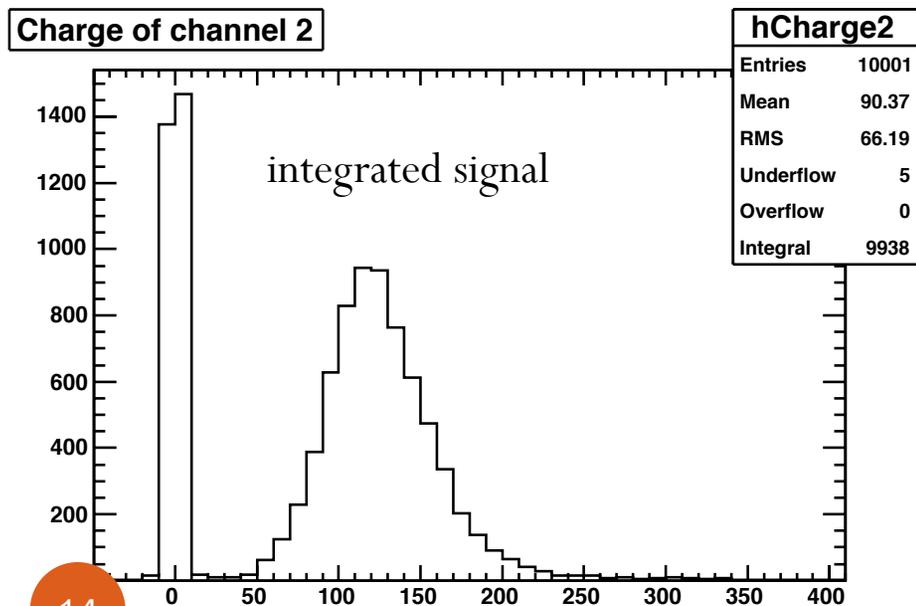
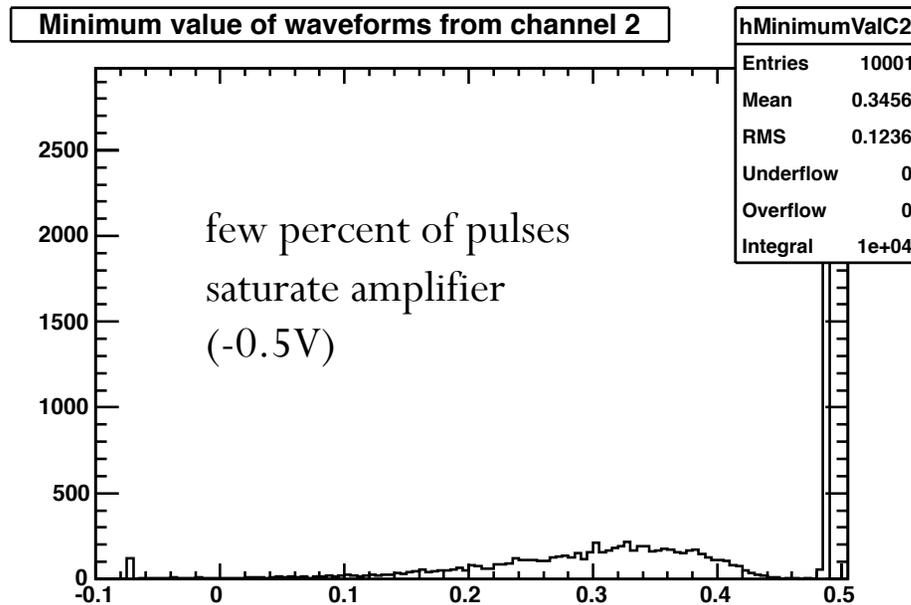
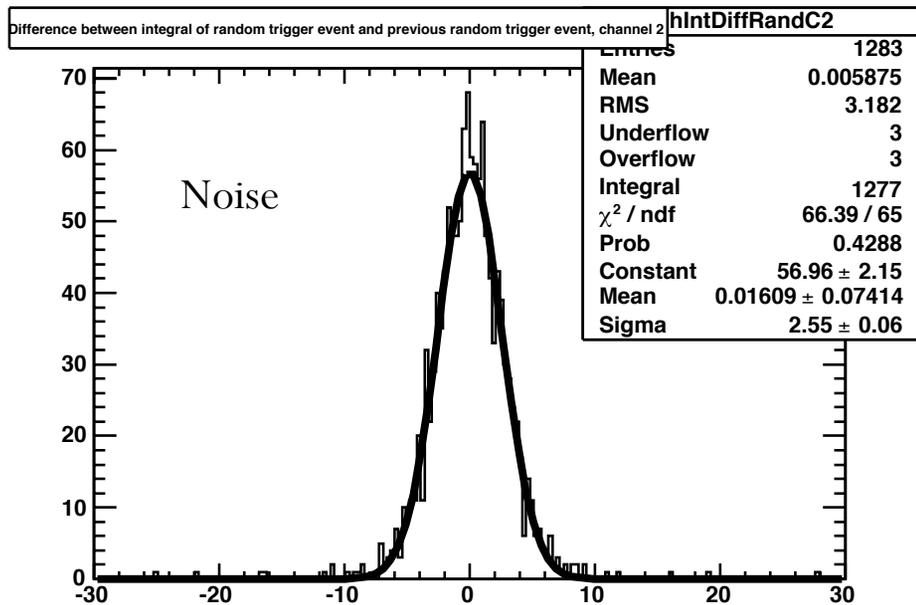
# FFT (yellow) of 50 ohm amp on 20 micron chamber



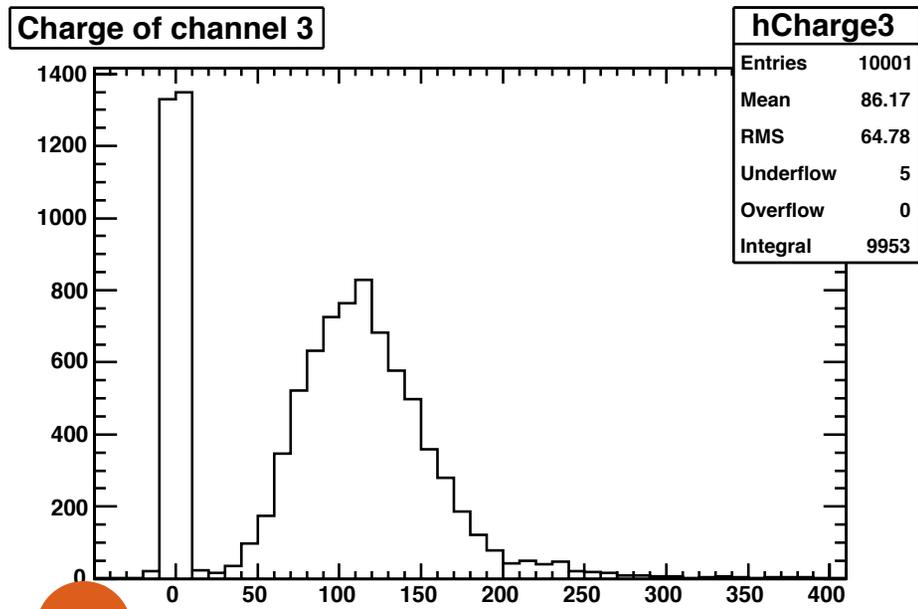
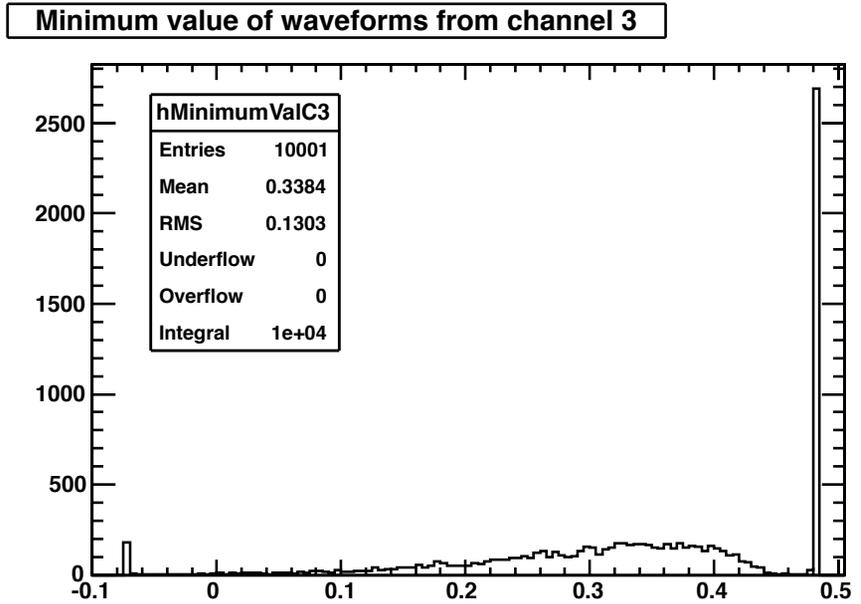
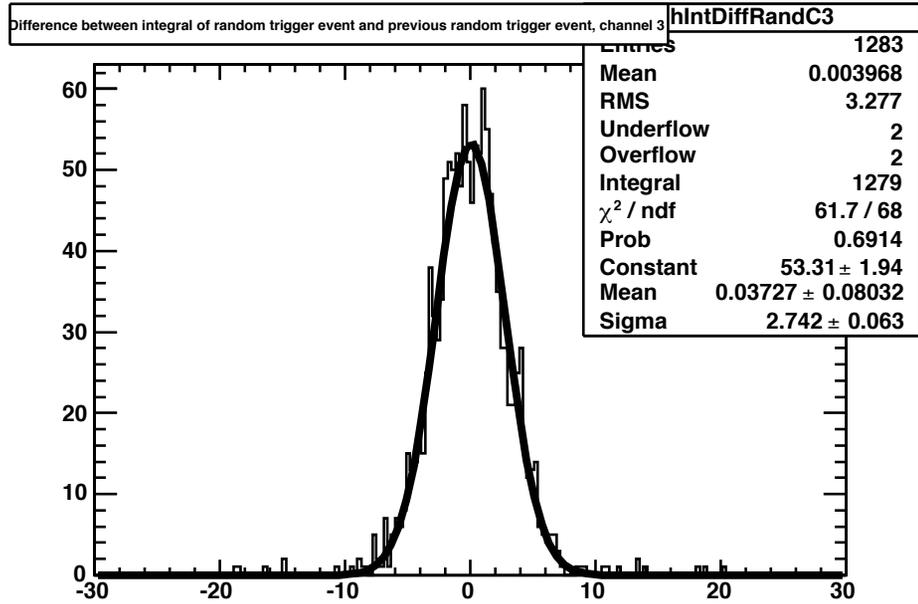
# FFT (yellow) of 50 ohm amp on 25 micron chamber. Possible oscillation at 260 MHz



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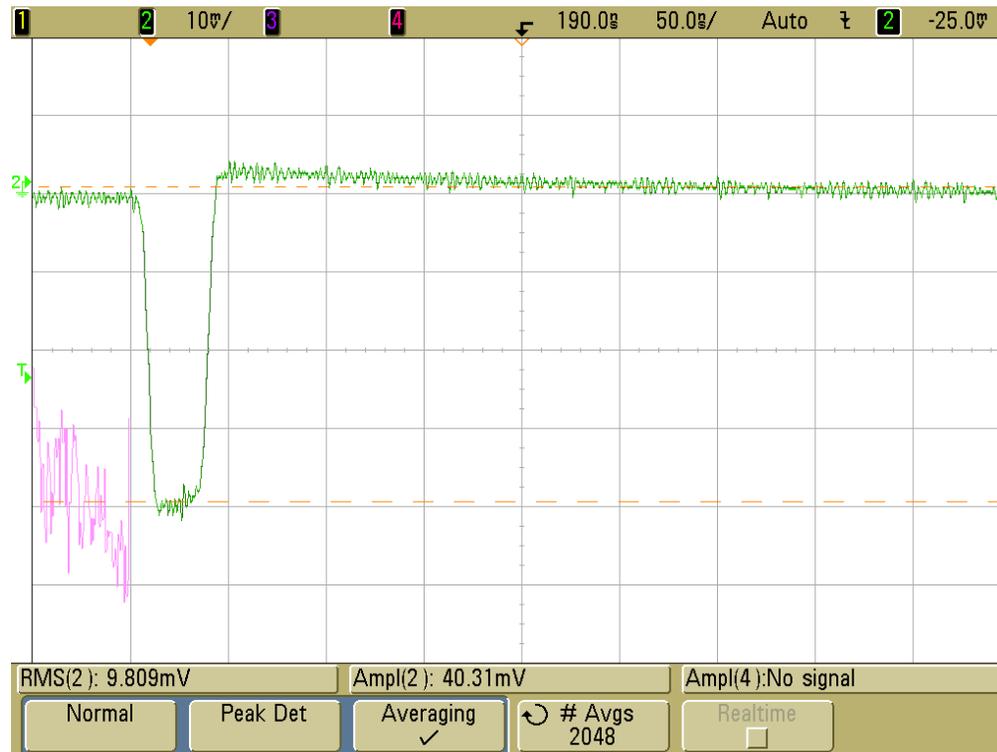
210 MeV/c, center of chamber, 20 micron chamber, 50 ohm amplifier



210 MeV/c, center of chamber, 25  
micron chamber

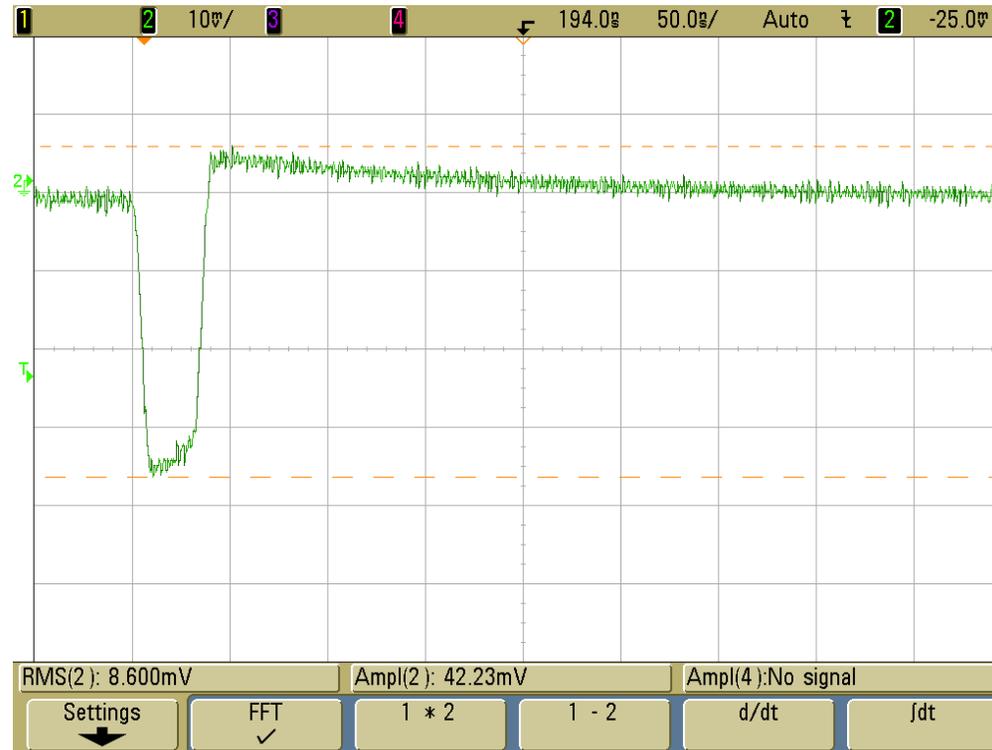
JP has modified the 180 and 370 ohm amps and will send them back today.

Signal: -80 mV, 40dB att, 30 nsec duration, Trise=5 nsec



380 Ohms amplifier, Chv= 900pF  
C1,C5 and C8 = 1 $\mu$ F  
+ 50 ohms modified post amplifier

Signal: -80 mV, 40dB att, 30 nsec duration, Trise=5 nsec

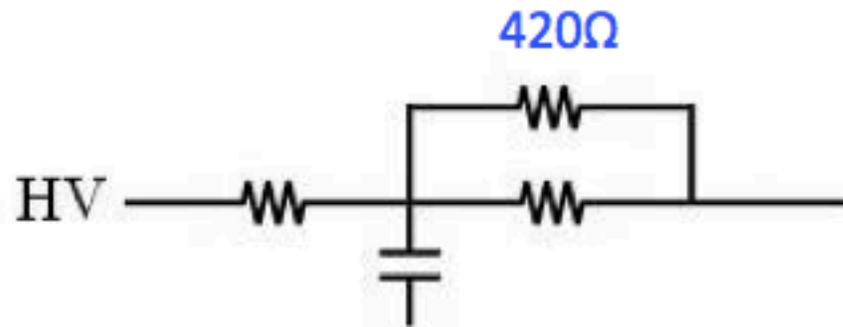
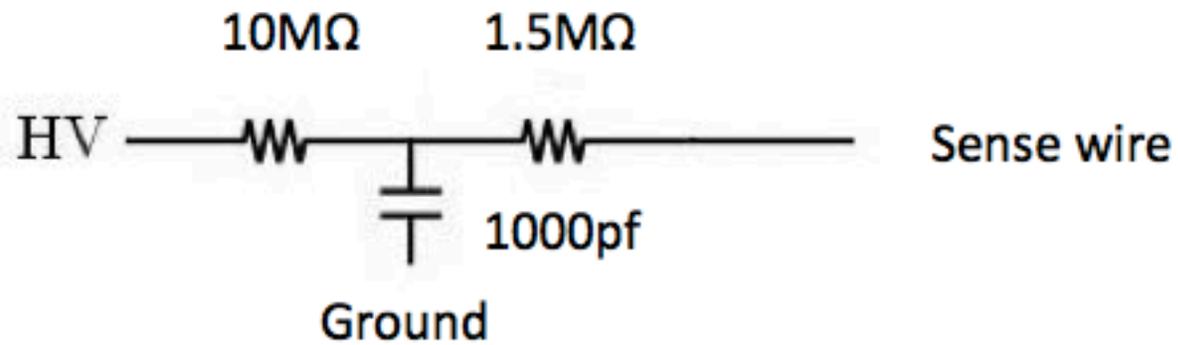


180 Ohms amplifier,  $C_{hv} = 900 \text{ pF}$   
 $C_1, C_5$  and  $C_8 = 1 \mu\text{F}$   
+ 50 ohms modified post amplifier

# Notes

- Should receive modified amplifiers Friday.
- Currently running with 50 ohm only.
- Why is the peak signal size significantly larger close to the HV end than in the center for the 25 micron chamber, whereas it is smaller for the 20 micron chamber?

Not terminated (signal can bounce)



Terminated (signal can't bounce)