

BO VERTICAL SLICE TEST UPDATE

Ben Jones, MIT

Bo So Far

- **Run 1:**

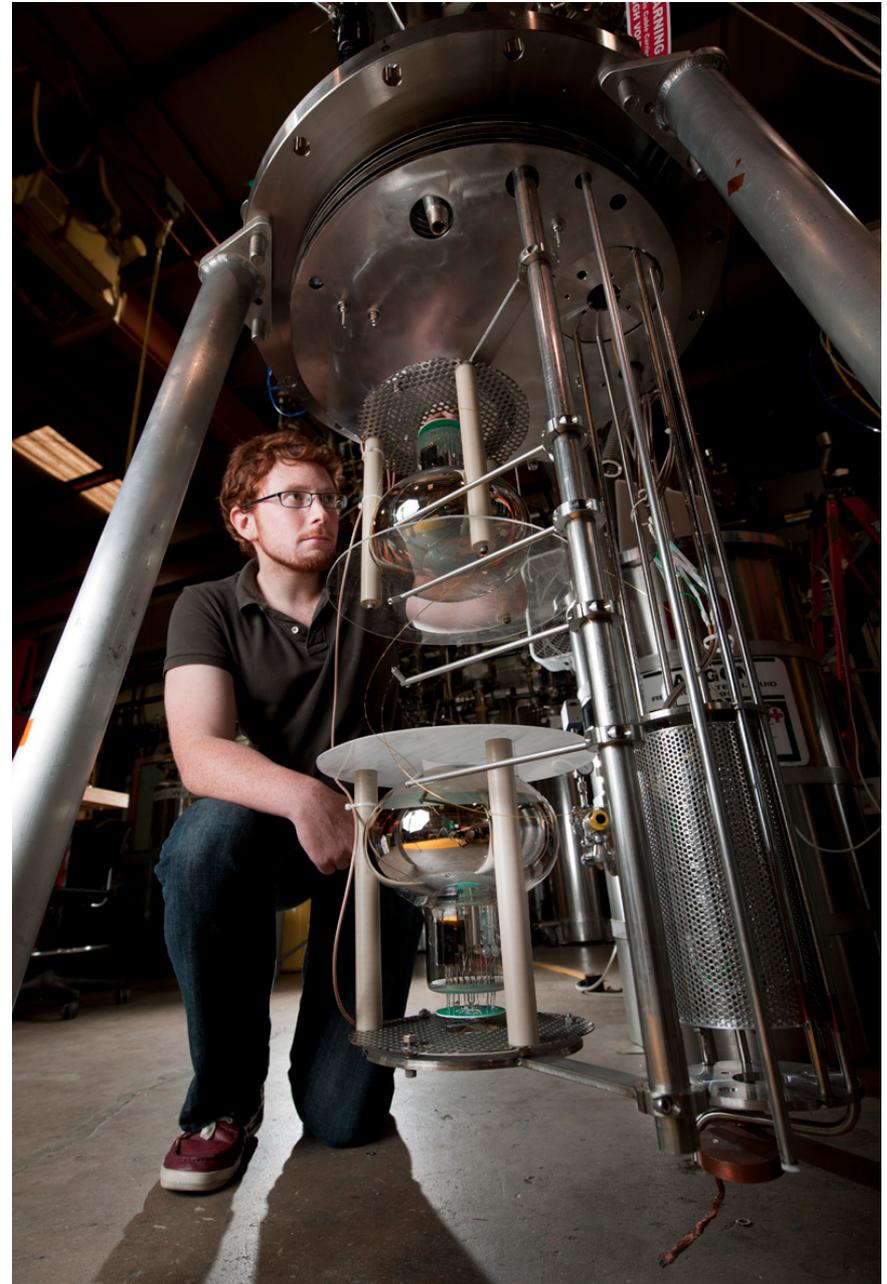
- All Fibers + feedthroughs working
- Practice close + fill procedure
- Operate PMT and measure gain, linearity, stability over a few days
- Characterize Visible LEDs
- Test cosmic trigger

Top:

Mechanical model PMT
Blank plate

Bottom:

Prototype / spare PMT
“Homebrewed” TPB Plate



Bo So Far

- **Run 2:**

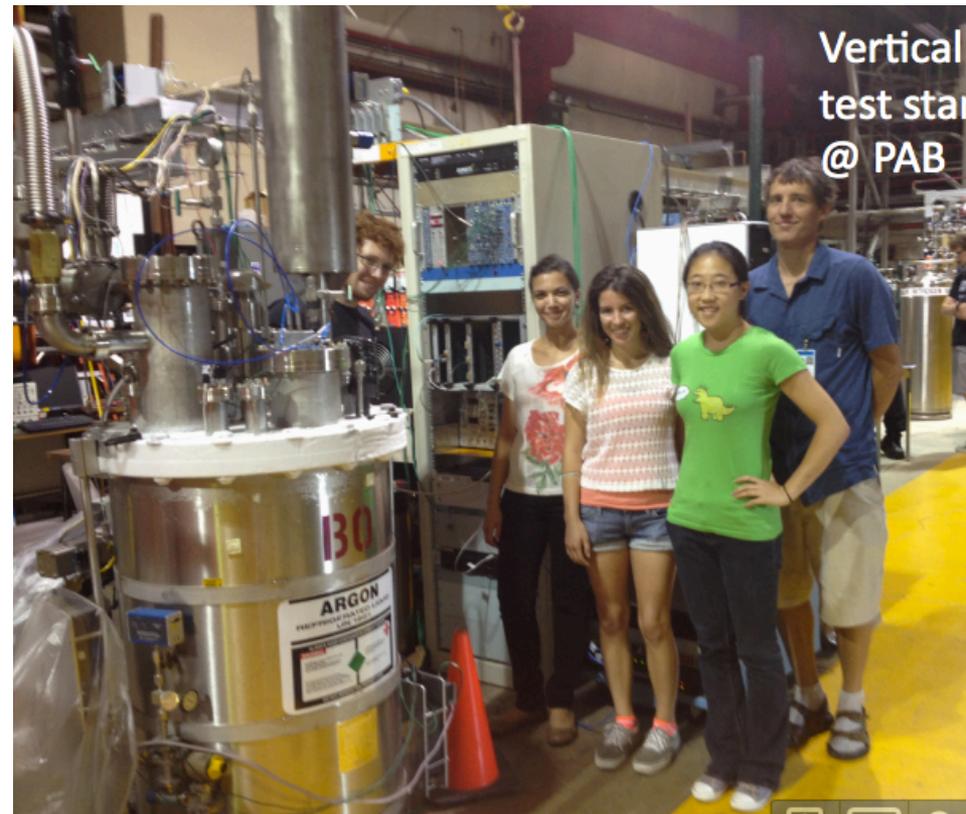
- Install + characterize UV LEDs
- Check response of plated / nonplated PMT (opacity, UV visibility etc)
- Installation of electronics, hardware + software
- First demonstration of uBooNE style PMT readout in LAr

Top:

Prototype / spare PMT
Blank plate

Bottom:

MicroBooNE PMT 13
“Homebrewed” TPB Plate



Bo So Far

- **Run 3:**

- “Real” VST configuration
- Ongoing electronics work
- Get everything server controlled
- Continued characterization of LED and cosmic response
- Open Monday, closed Thursday, filled by Monday

Top:

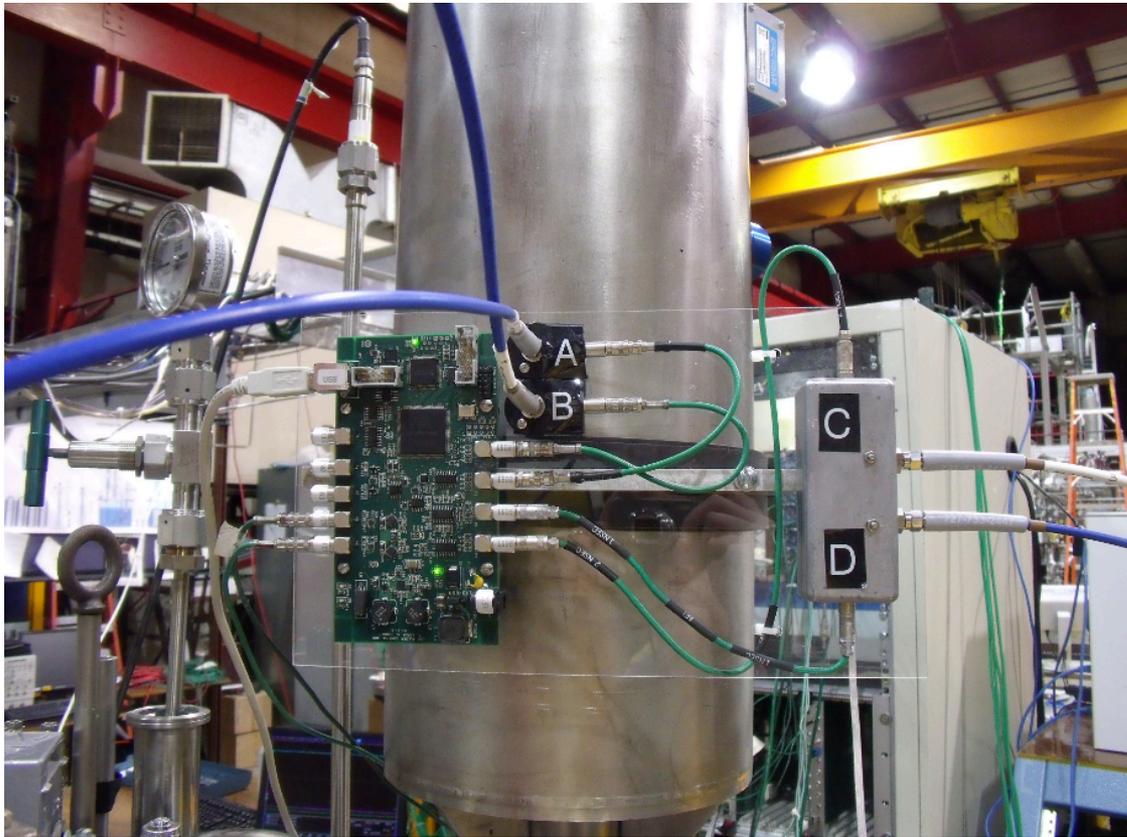
MicroBooNE PMT 13
“Professional” TPB Plate 1

Bottom:

MicroBooNE PMT 16
“Professional” TPB Plate 2



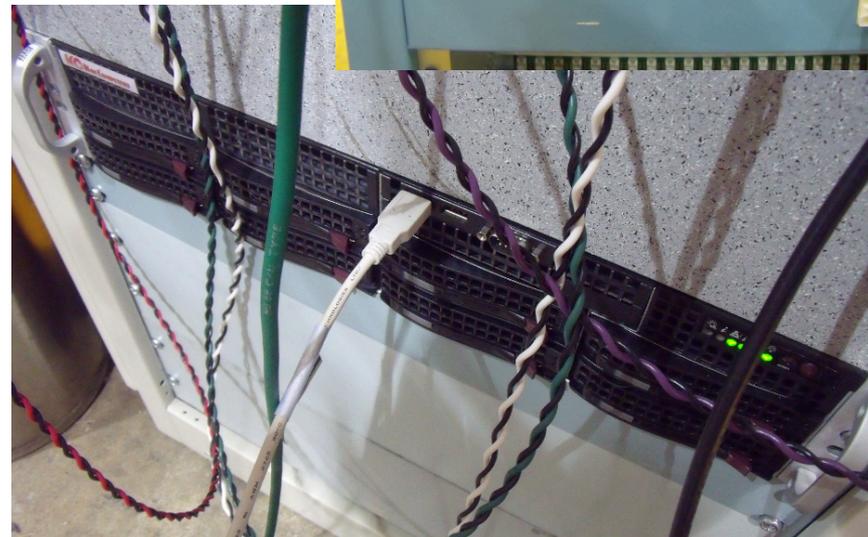
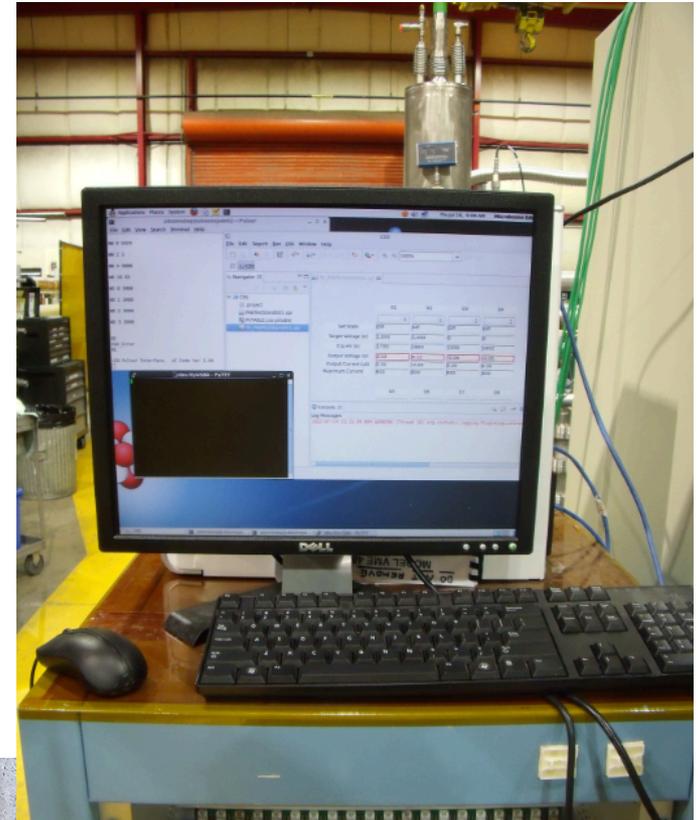
New LED Mounting



- New LED + Pulser mounting onto condenser tower
- Stylish acrylic backboard
- Artistic component layout
- As well as being beautiful, also solves actual problems with ice, cabling, fiber stresses, etc.

Server LED Control

- After many hours of tedious error chasing, PMT pulser now operable from uboonepab02 server
- Predefined pulse sequences can be configured with scripts, and settings can be changed interactively with putty
- This pulser sequences two visible (A,B) and two UV (C,D) LEDs at rates from $\sim 1\text{Hz}$ to $\sim 1\text{MHz}$
- Sequences 1Hz and 100Hz are loaded onto uboonepab02



Simultaneous Readout

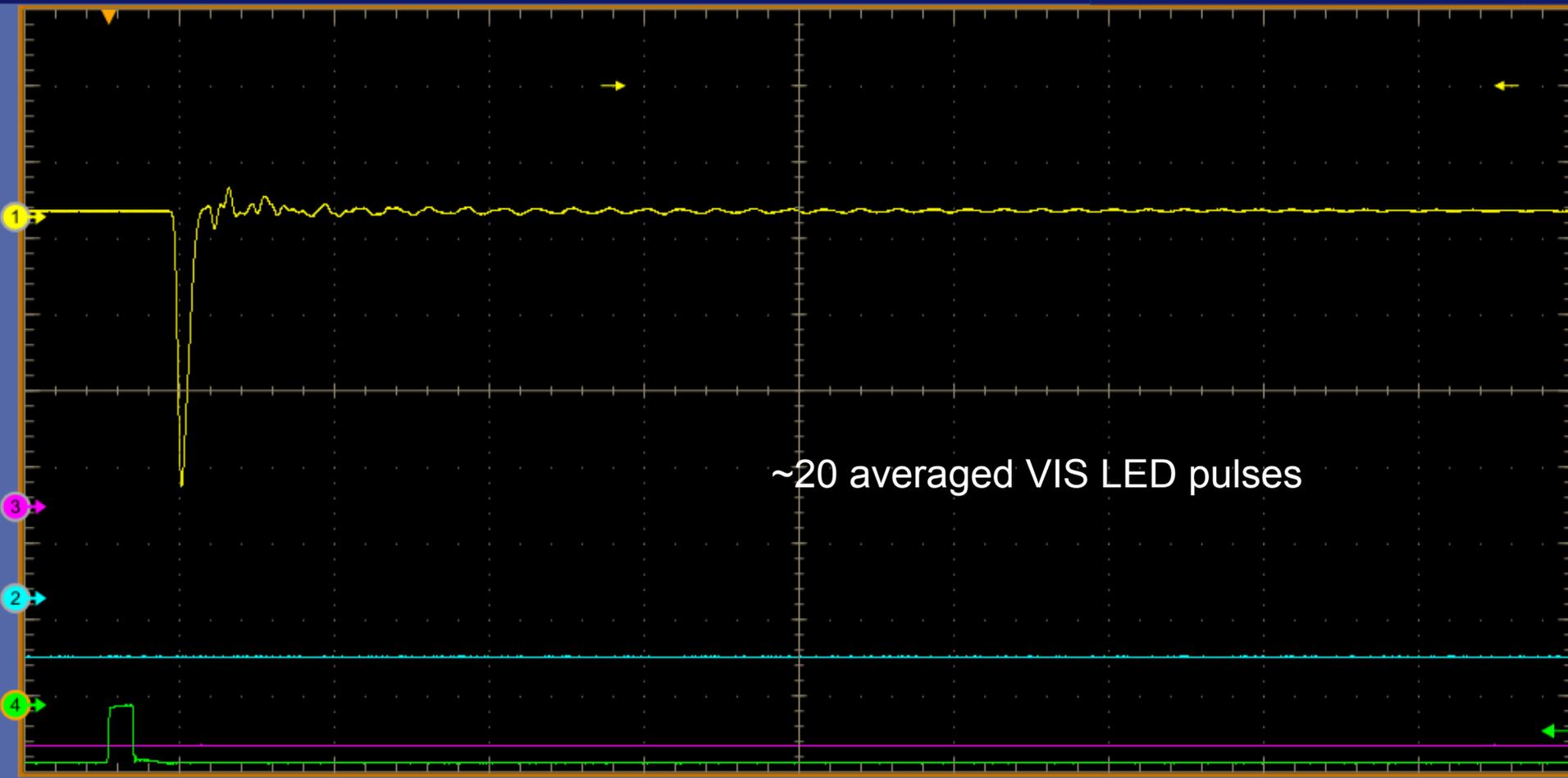


- We have organized the setup such that both PMT channels, three flag channels and trigger are fed simultaneously to:
 - Nevis electronics
 - Tektronix scope
- Now pulser is server controlled, and since HV is already approved for unattended operation we can enter a mode of approx. 24 hour running
- Moving into a mode where groups can work on the electronics development and optical characterizations simultaneously.
- Electronics review and approval for unattended running to follow, then real slice test will commence

LED Visibility

- UV LED D appears not to be functional. Connectors have been checked and resoldered by Teppei, but no luck. More tests to follow to check “postage stamp” board
- UV visibility oddities from last run were not observed in this run, when PMT 13 was moved from bottom to top slot.
- No visible sign of TPB in cryostat – decided not to illuminate PMT itself with bright lights since it is a real uBooNE tube
- Full visibility characterizations from Run 3 to be presented next ADWG by Christie.



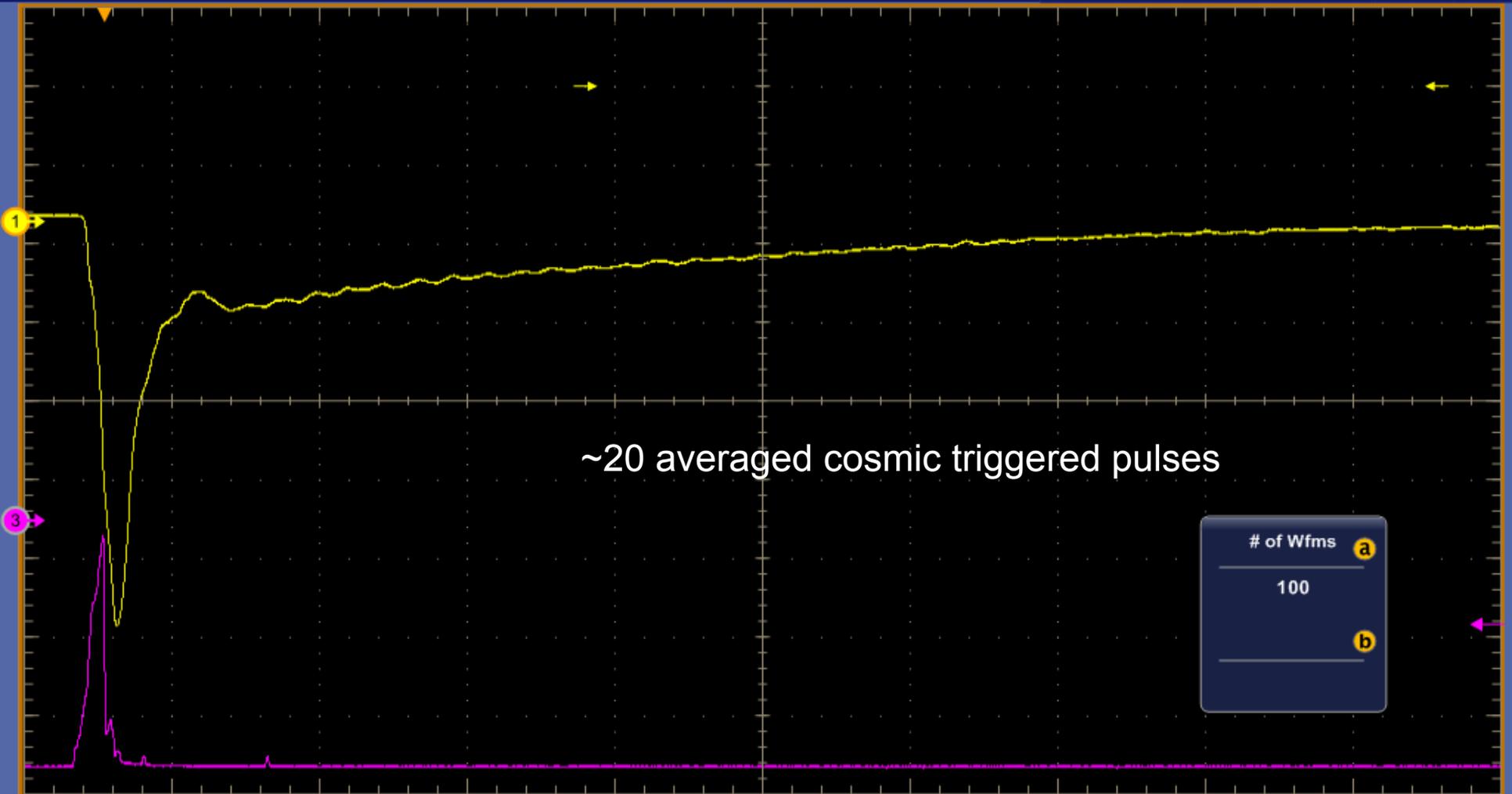


C1	90.0mV/div	50Ω	B _W :500M
C2	1.0V/div	50Ω	B _W :500M
C3	500mV/div	50Ω	B _W :500M
C4	1.0V/div	50Ω	B _W :500M

A₁ C4 \int -340mV
Ready Normal

200ns/div 5.0GS/s 200ps/pt
Run Average:100
77 acqs RL:10.0k
Man July 23, 2012 17:13:07

	Value	Mean	Min	Max	St Dev	Count	Info
C1 Area	7.515nVs	7.5145055n	7.515n	7.515n	0.0	1.0	
C2 Area	-871.6nVs	-871.6278n	-871.6n	-871.6n	0.0	1.0	
Hs Mean	102.0ns	101.95928n	100.4n	102.3n	183.4p	81.0	
Hs Std Dev*	11.44ns	11.456731n	11.37n	11.83n	64.94p	81.0	

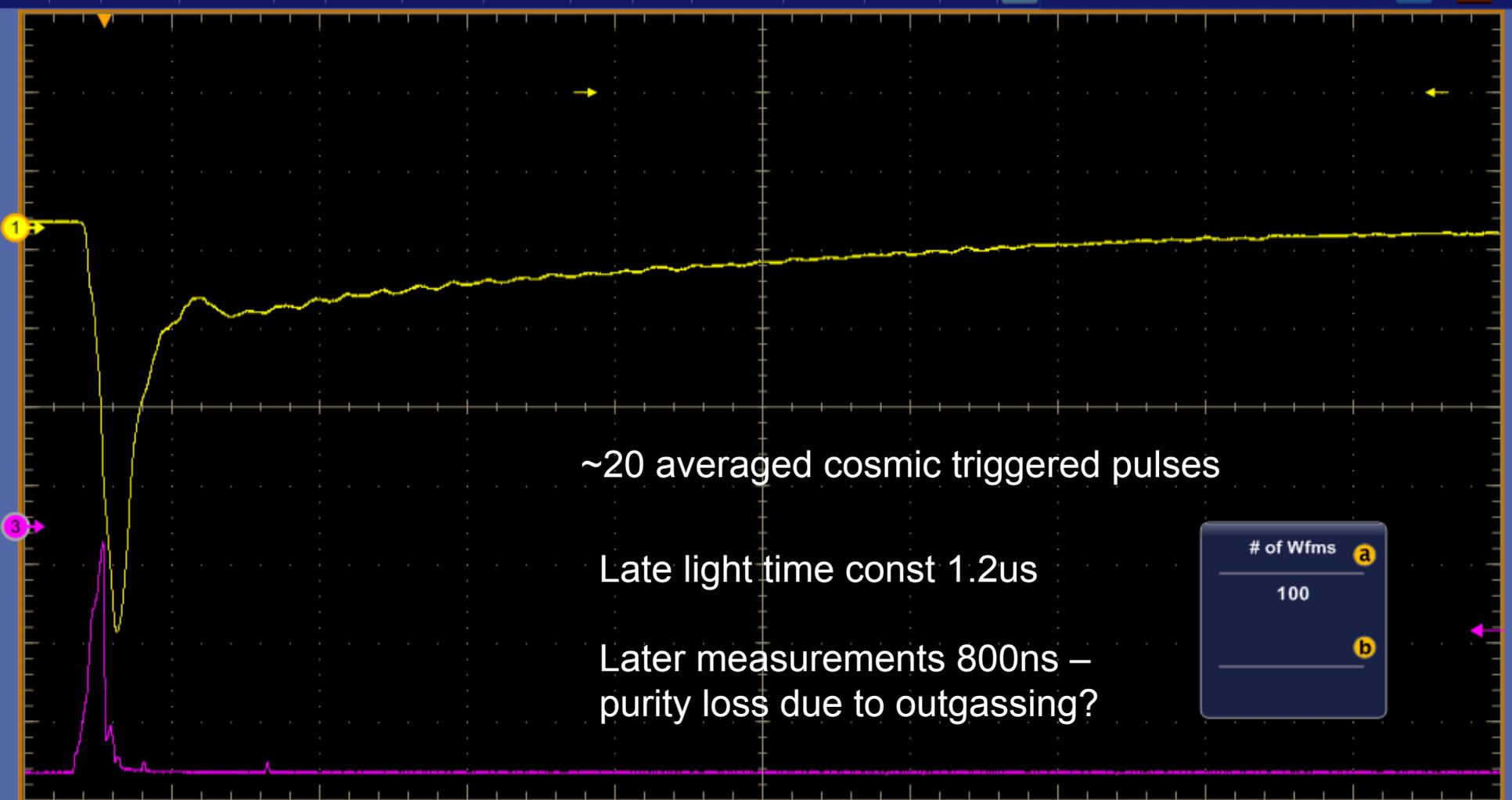


C1 200mV/div 50Ω $B'_W: 500M$
C3 500mV/div 50Ω $B'_W: 500M$

A' C3 $\sim -660mV$
 Ready Normal

200ns/div 5.0GS/s 200ps/pt
Run Average:100
 22 acqs RL:10.0k
 Man July 23, 2012 17:08:46

	Value	Mean	Min	Max	St Dev	Count	Info
C1 Area	-64.58nVs	-64.584825n	-64.58n	-64.58n	0.0	1.0	
C2 Area	-871.0nVs	-870.98742n	-871.0n	-871.0n	0.0	1.0	
Hs Mean	1.26μs	1.2819261μ	116.4n	1.516μ	309.4n	28.0	
Hs Std Dev*	282.8ns	275.91379n	106.1n	330.9n	42.82n	28.0	

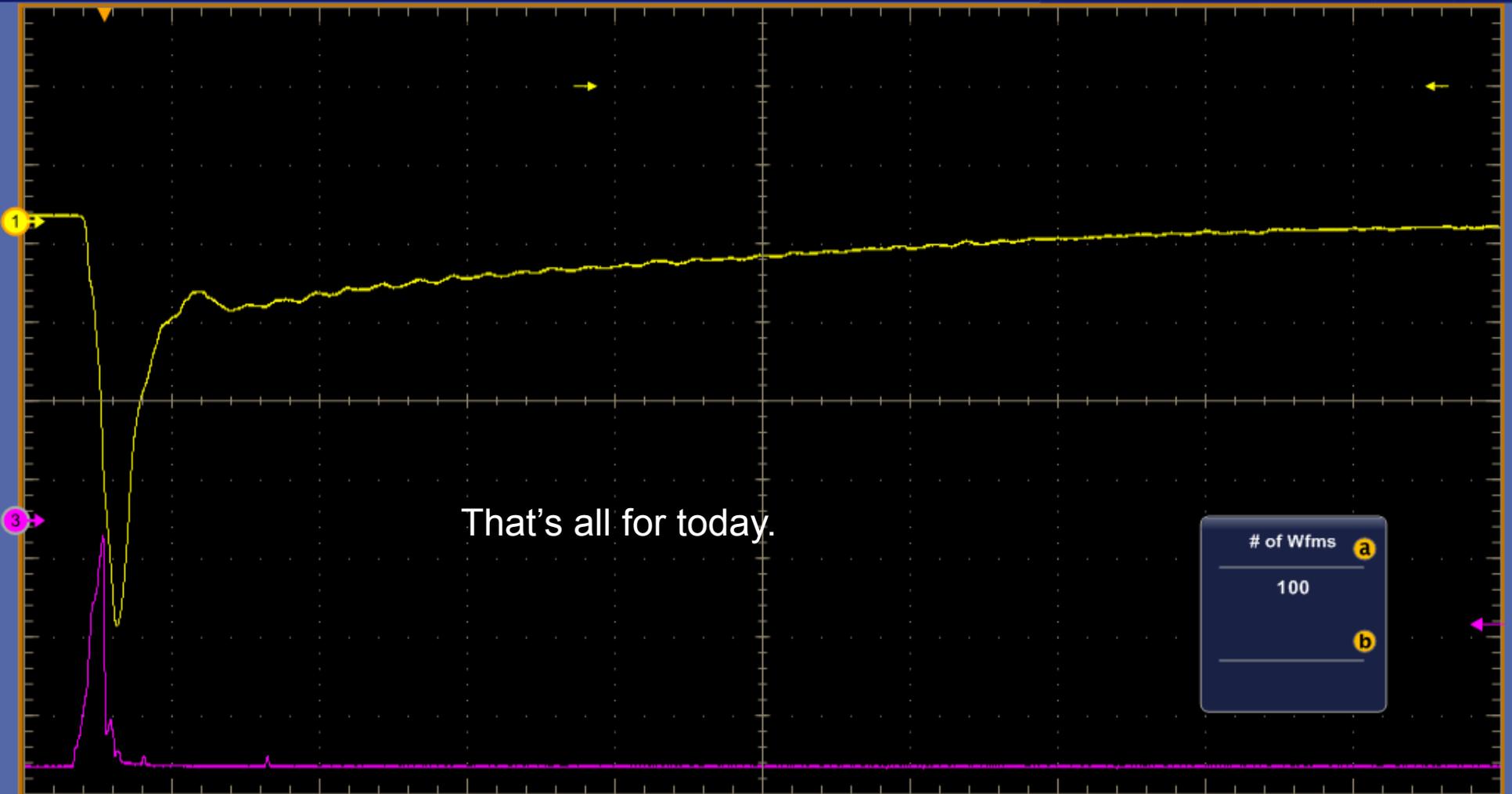


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That's all for today.

of Wfms **a**

100

b

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C3 500mV/div 50Ω B_W:500M

A' **C3** -660mV

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