

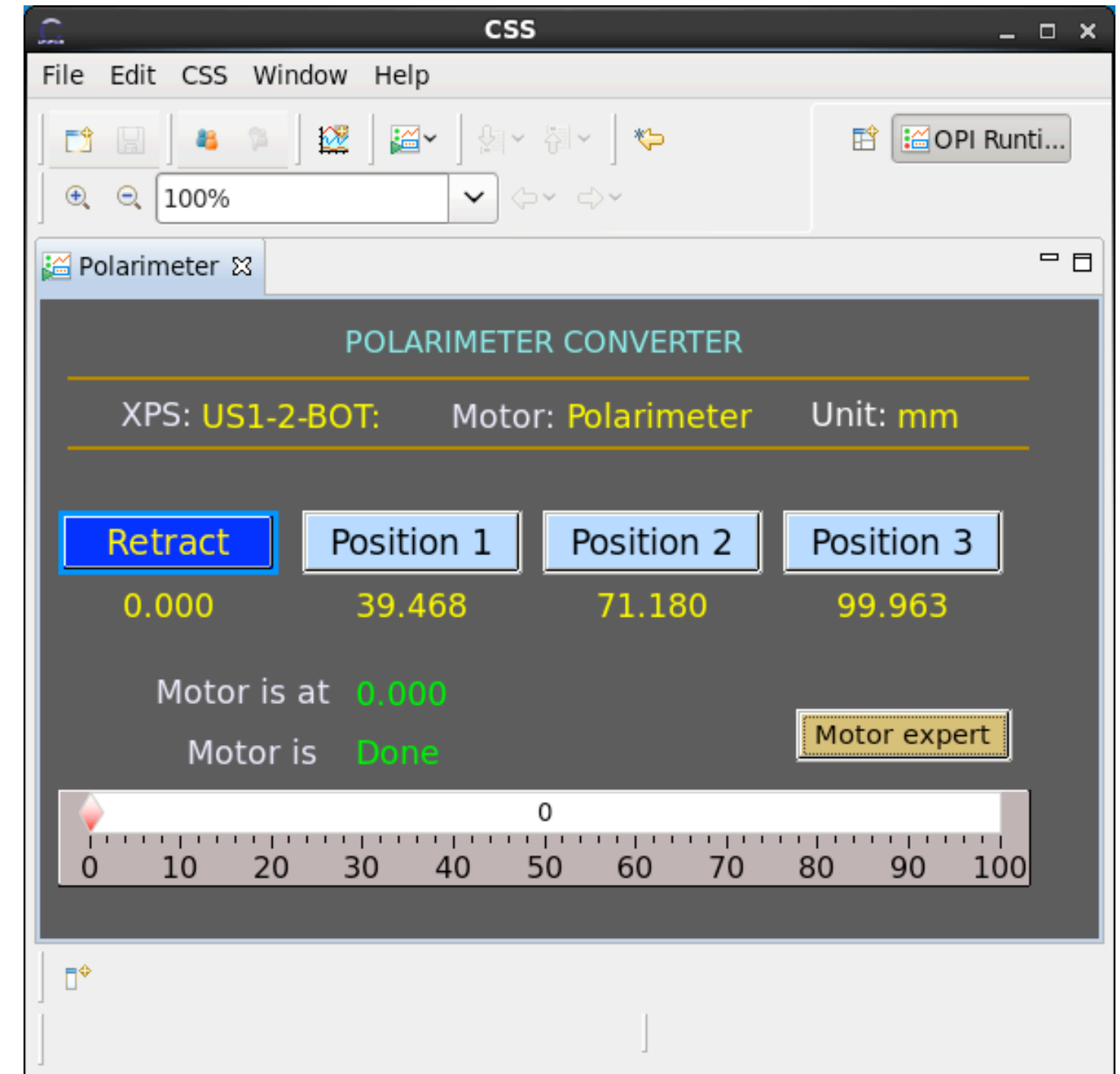
Install of Triplet Polarimeter in Hall D

- Set HV in hall (4/16)
- Reduce noise levels (4/17)
- Check noise without pump (4/20)

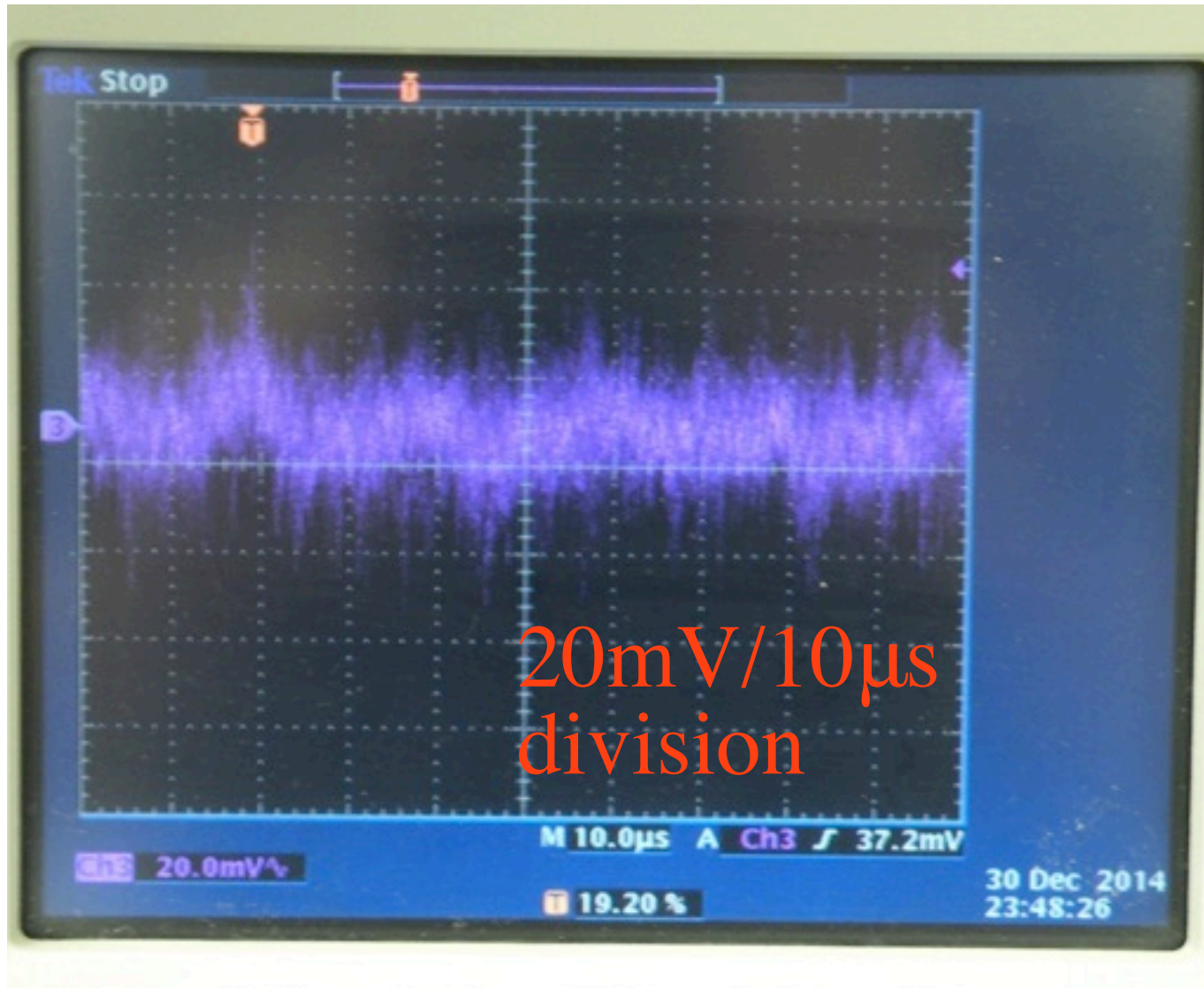
April 22, 2015
Kei Moriya, Michael Dugger

Motor Control GUI

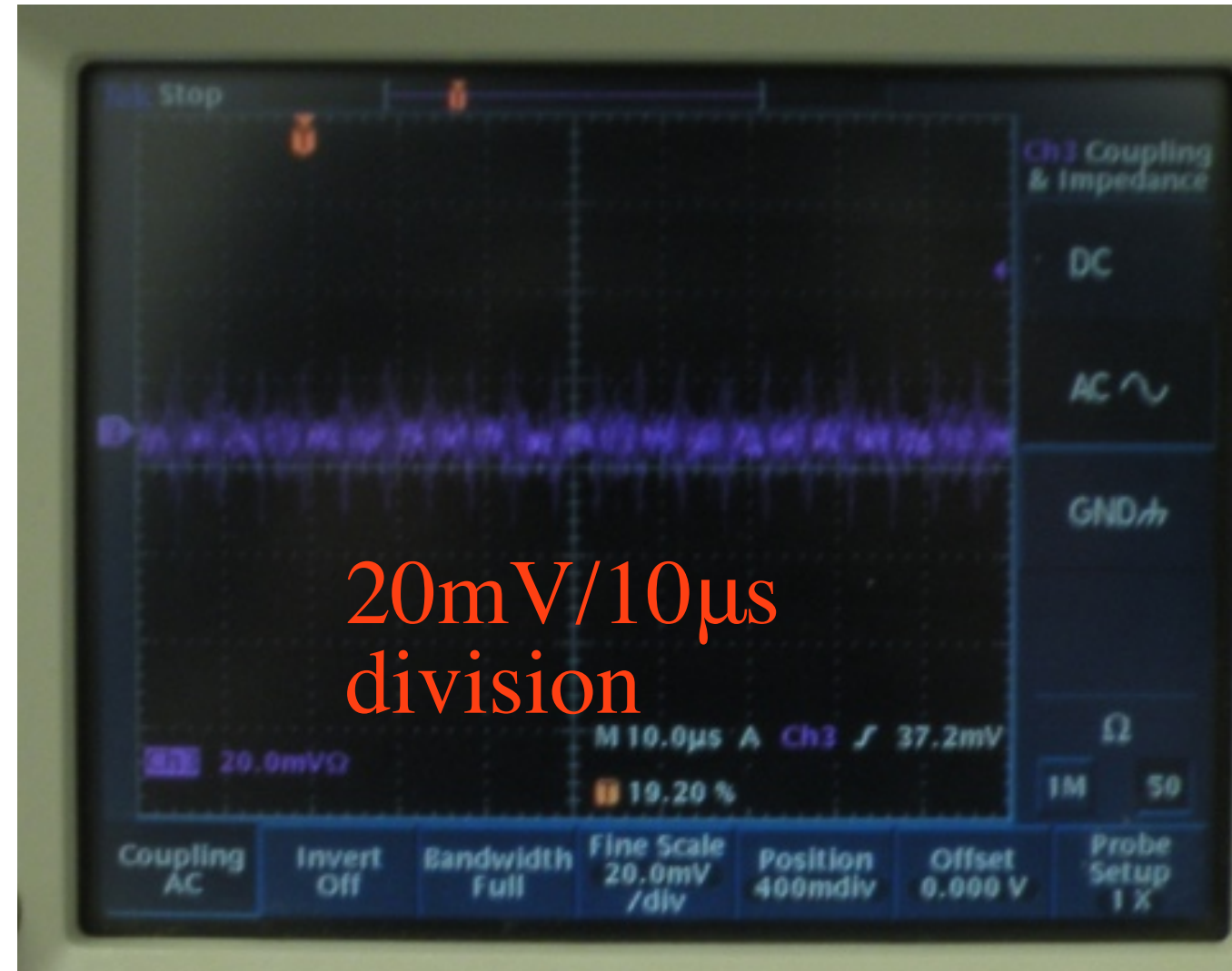
- Open CSS, on the main button panel in the “BEAM” section select “MOTORS”, then in the new window click on “Polarimeter Converter”
- Buttons show converter positions in mm. Probably will be updated to show converter thicknesses



Noise Levels with HV

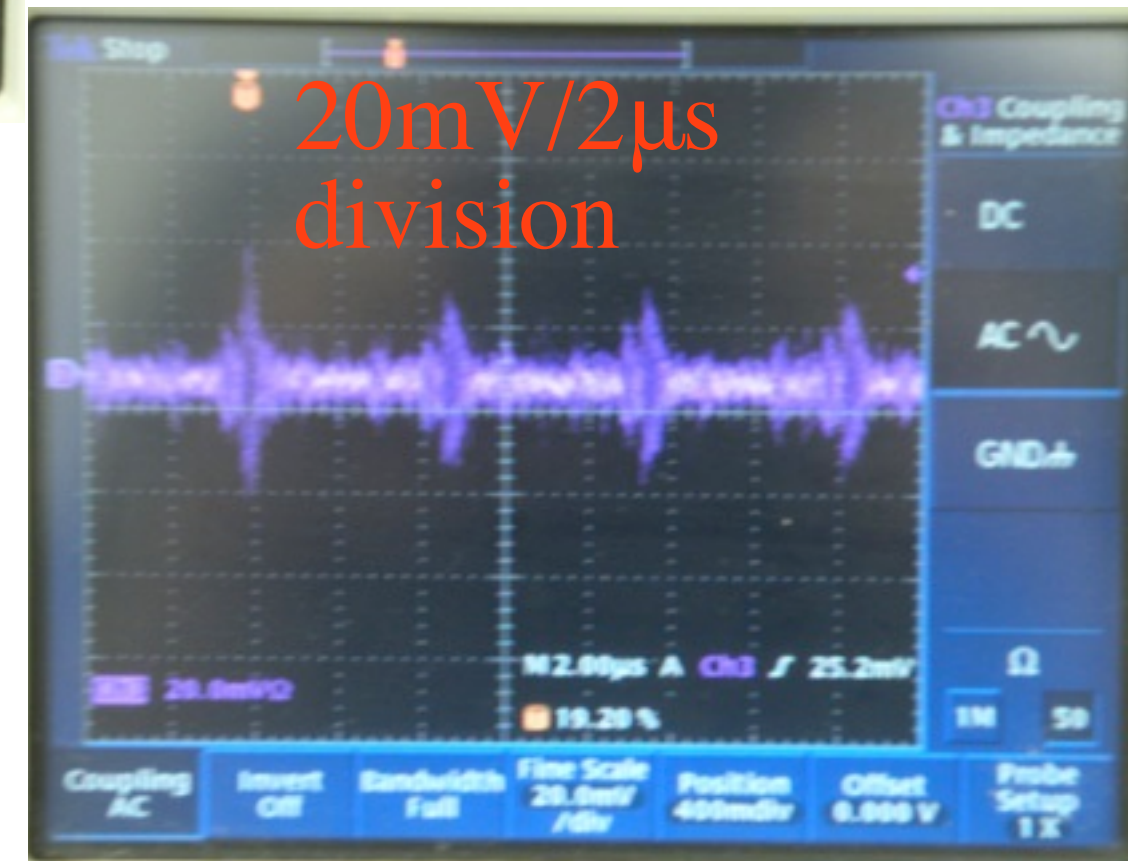
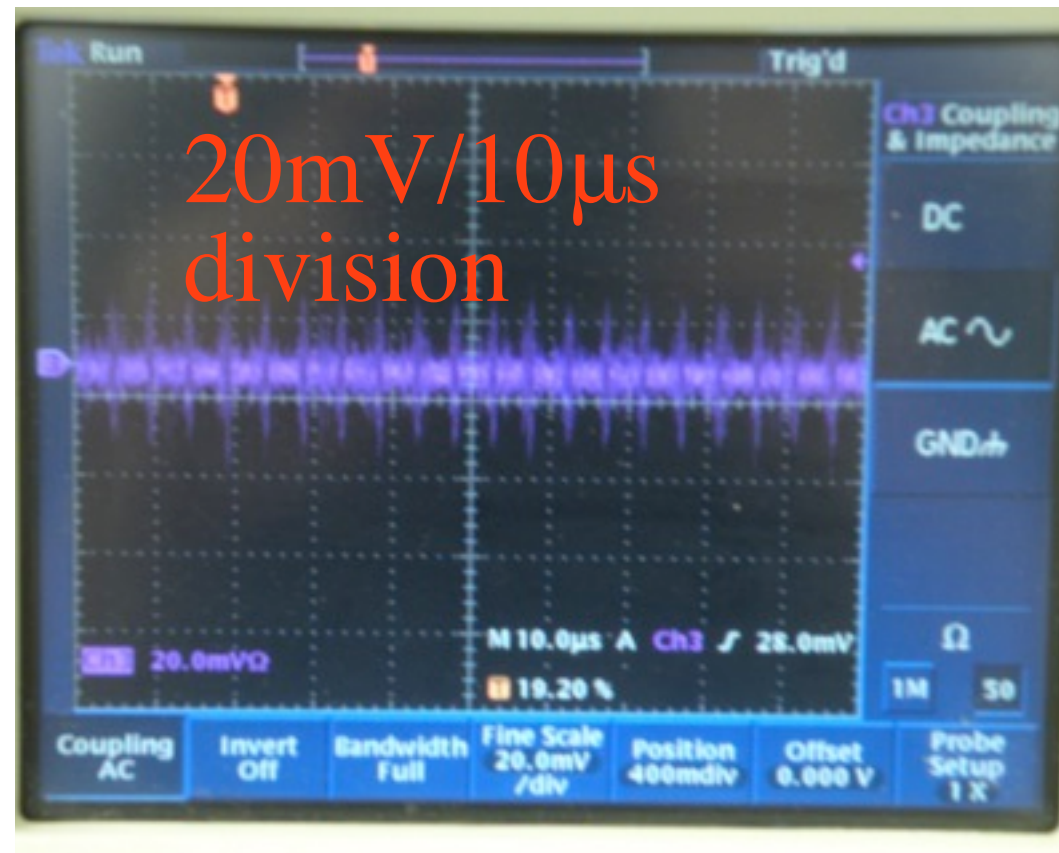
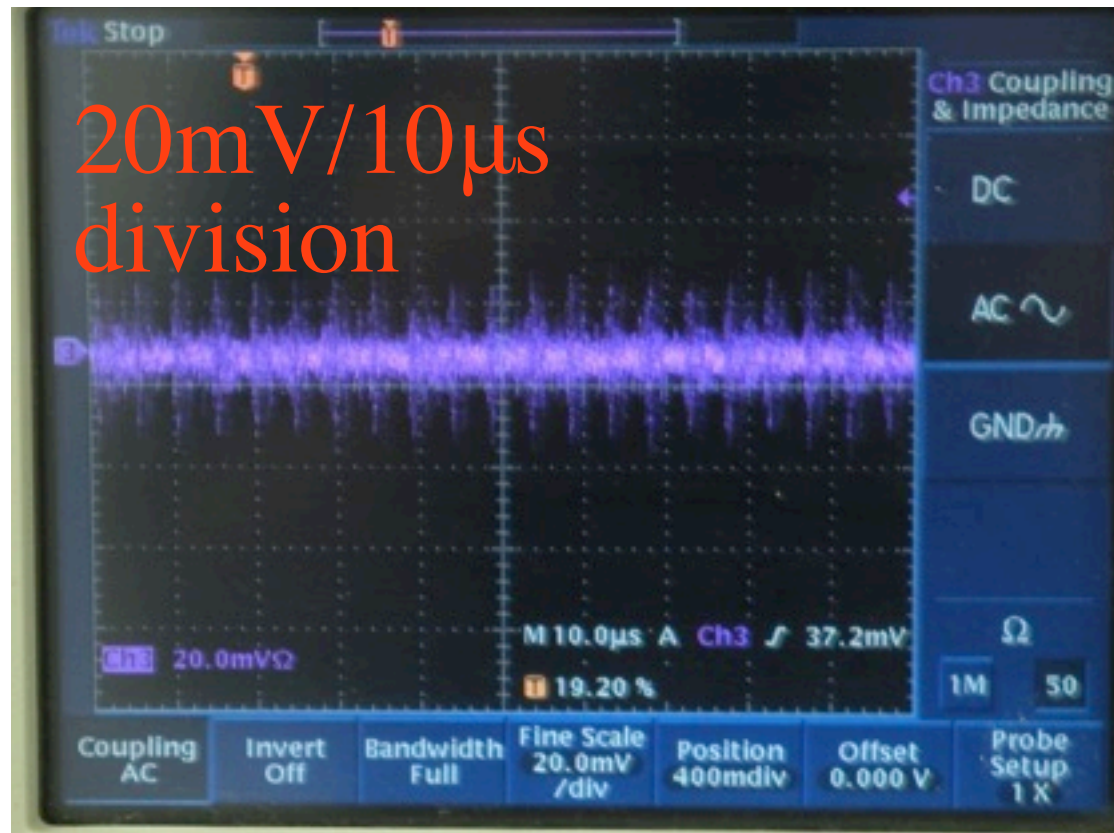


0 V

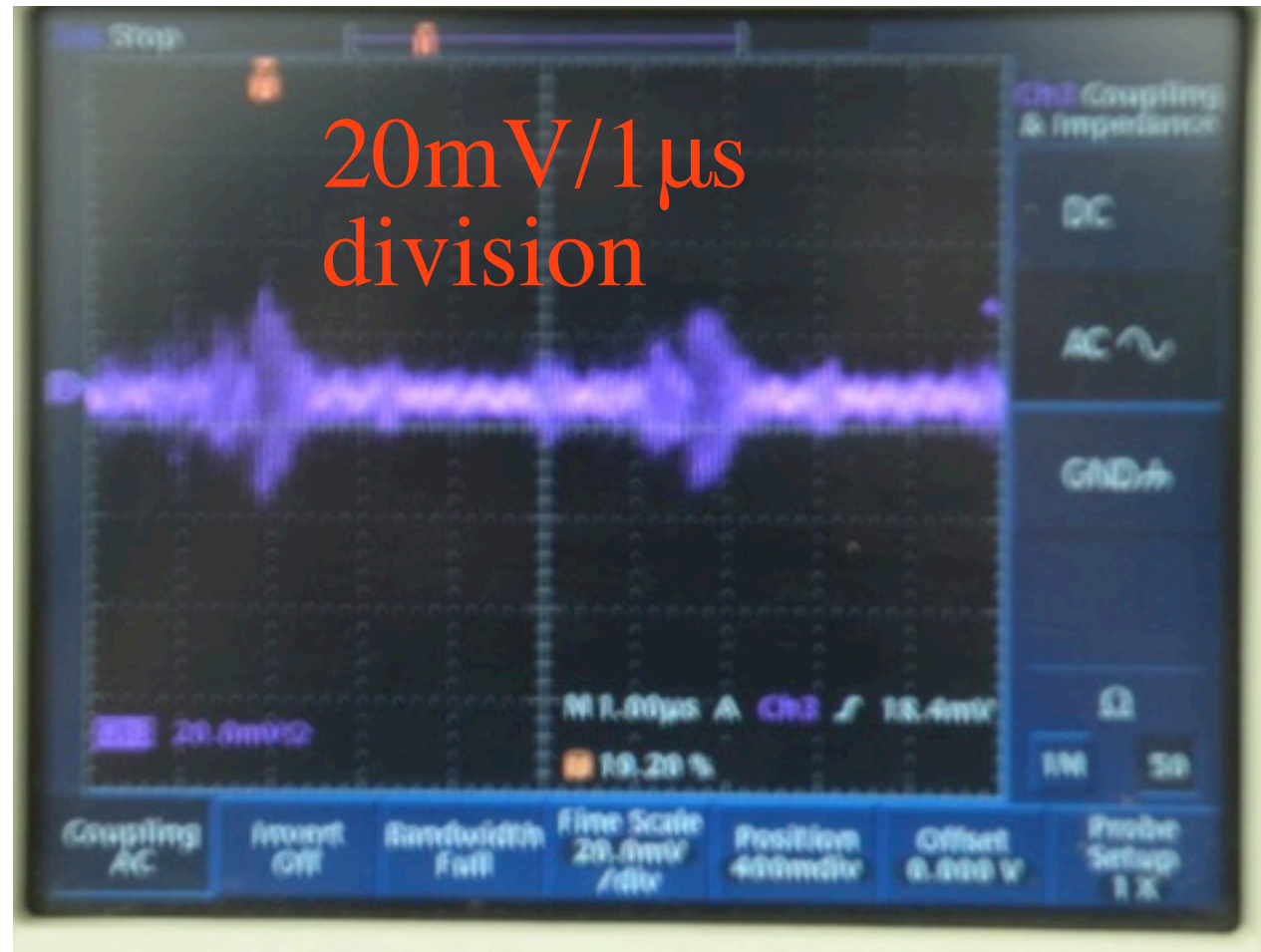


100 V

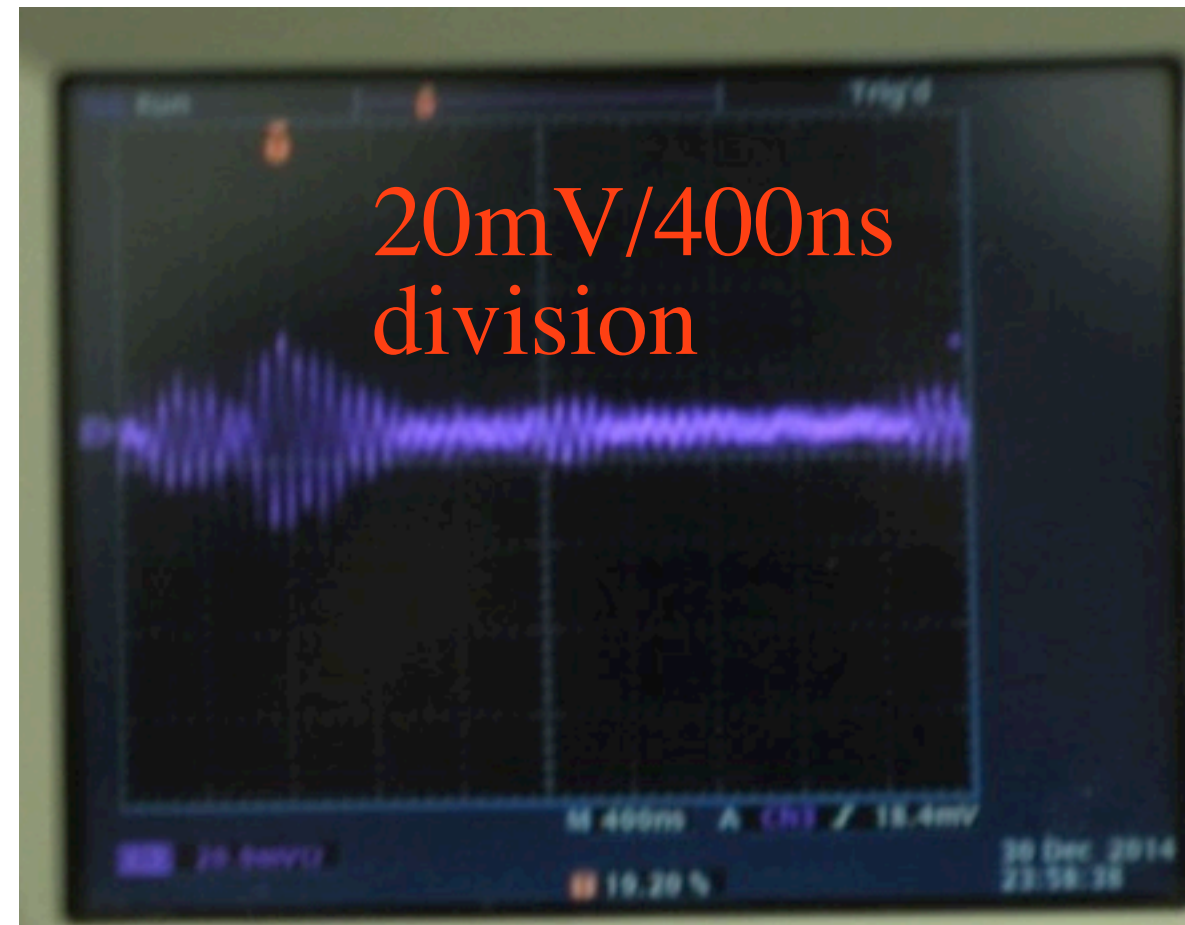
Noise Levels with HV



Noise Levels with HV



200 V

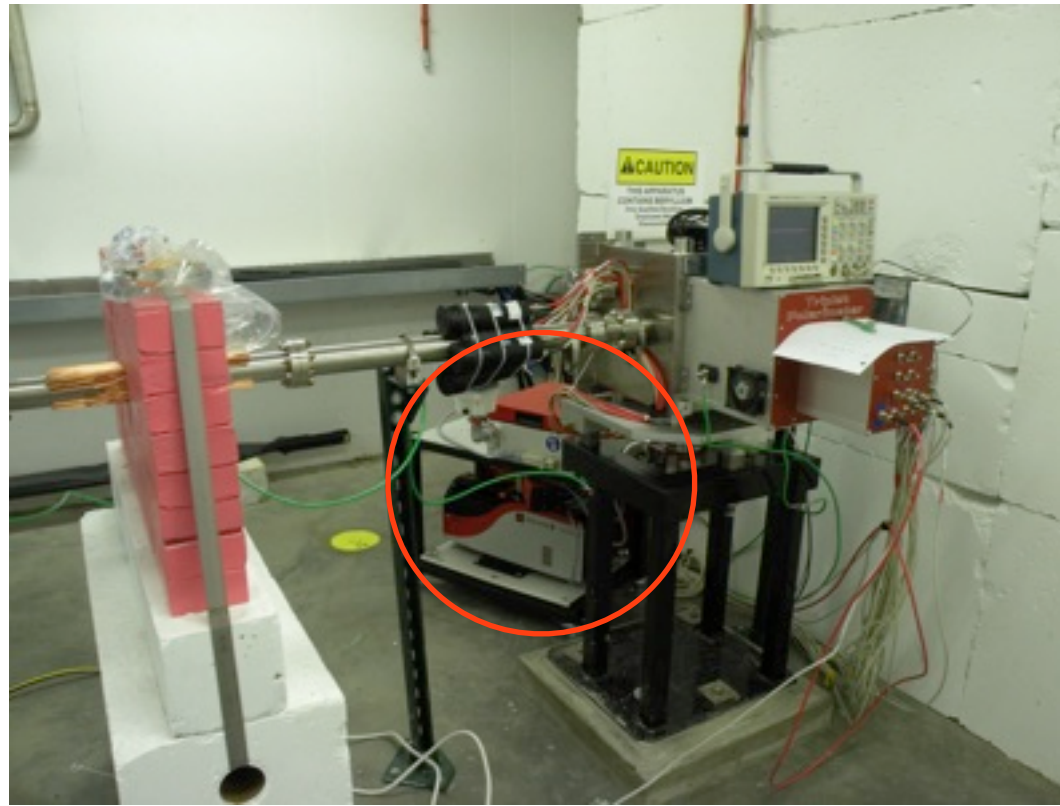


200 V

Surroundings



pumping down vacuum in
beamline, pressure ~ 75 mTorr
during noise tests



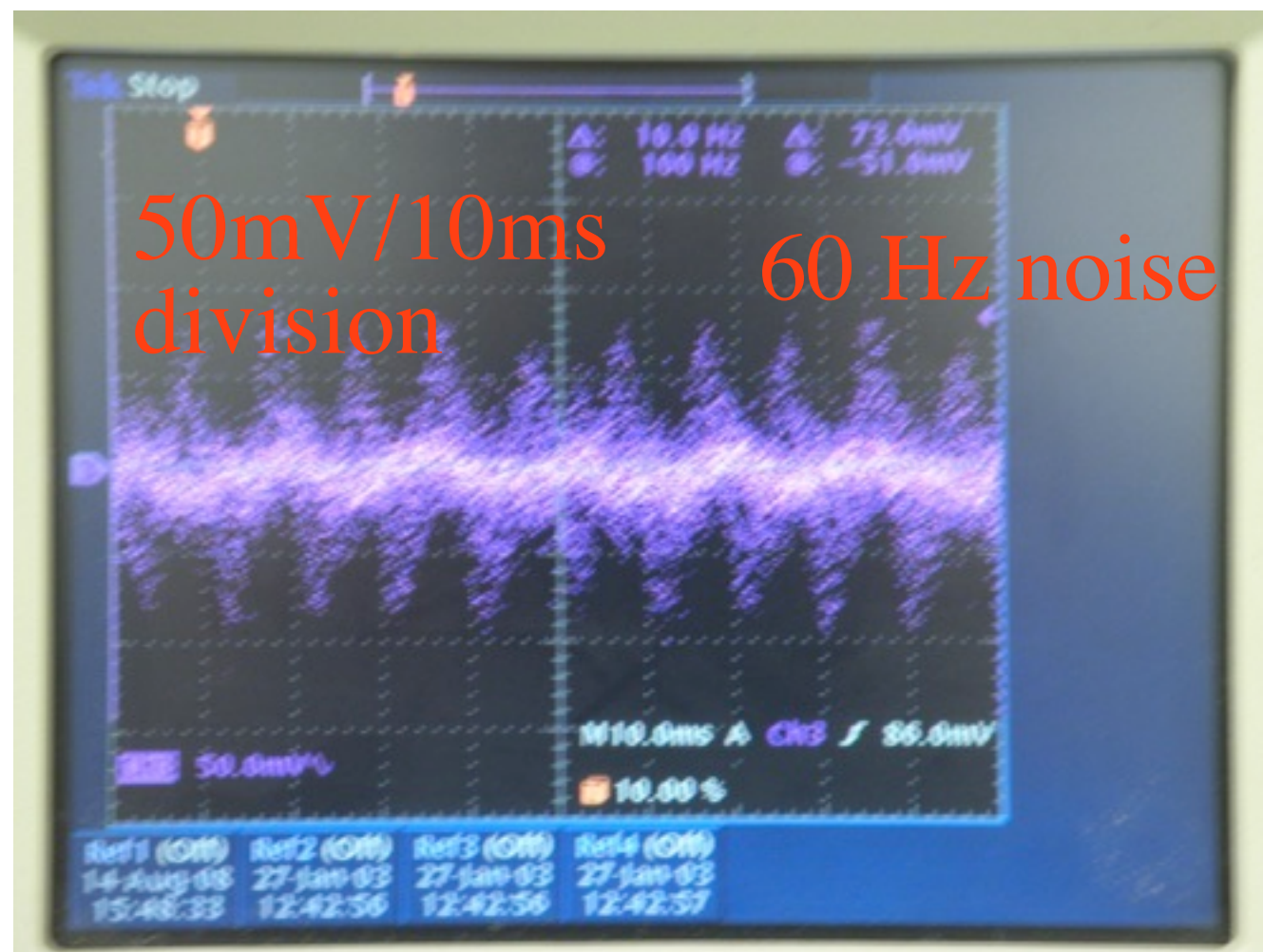
turbo pump by polarimeter was
NOT on during noise tests



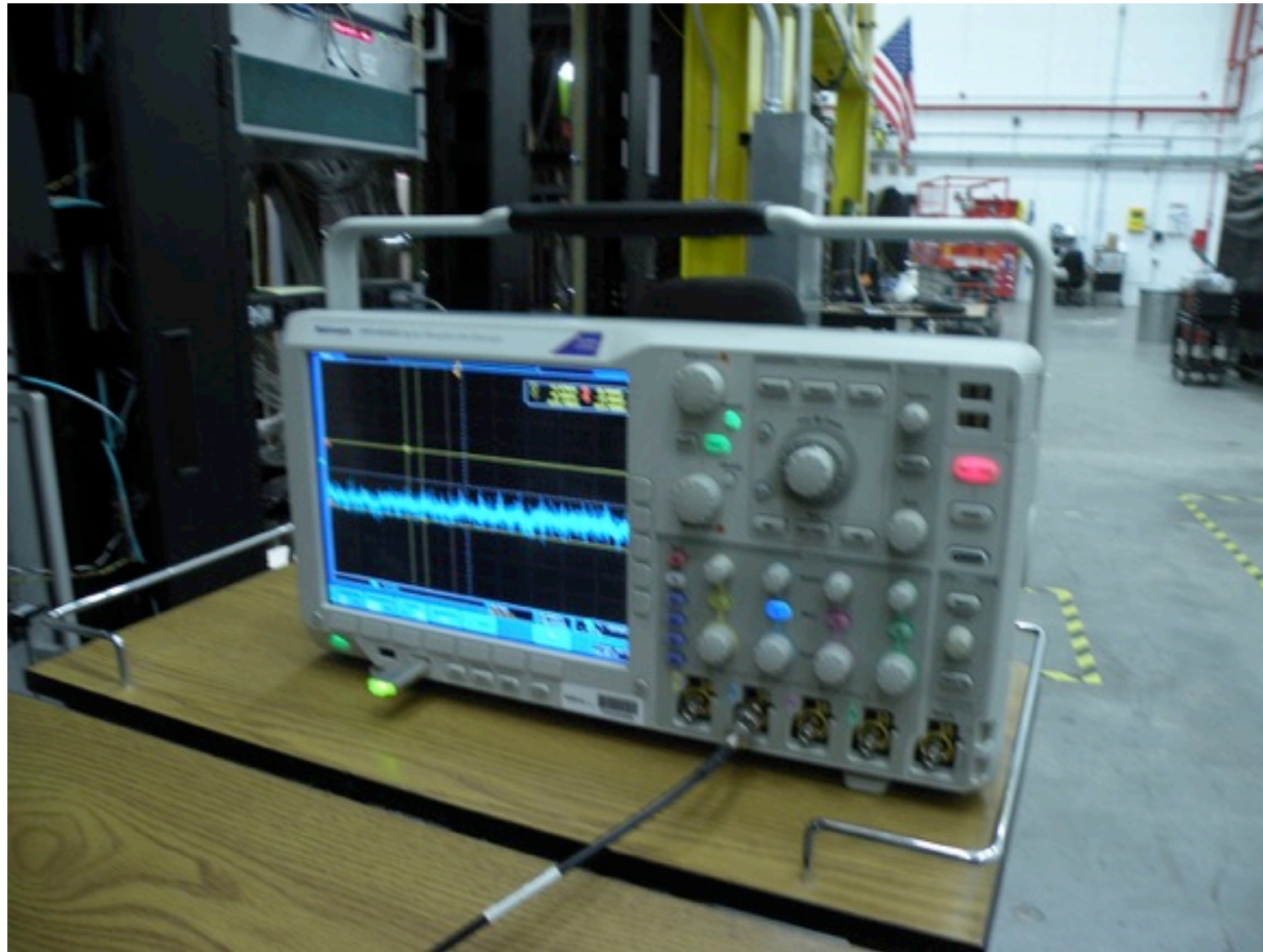
New LV Supply

- Borrowed from Fernando, Nick, Chris
- Should be clean
- We can use this supply if necessary

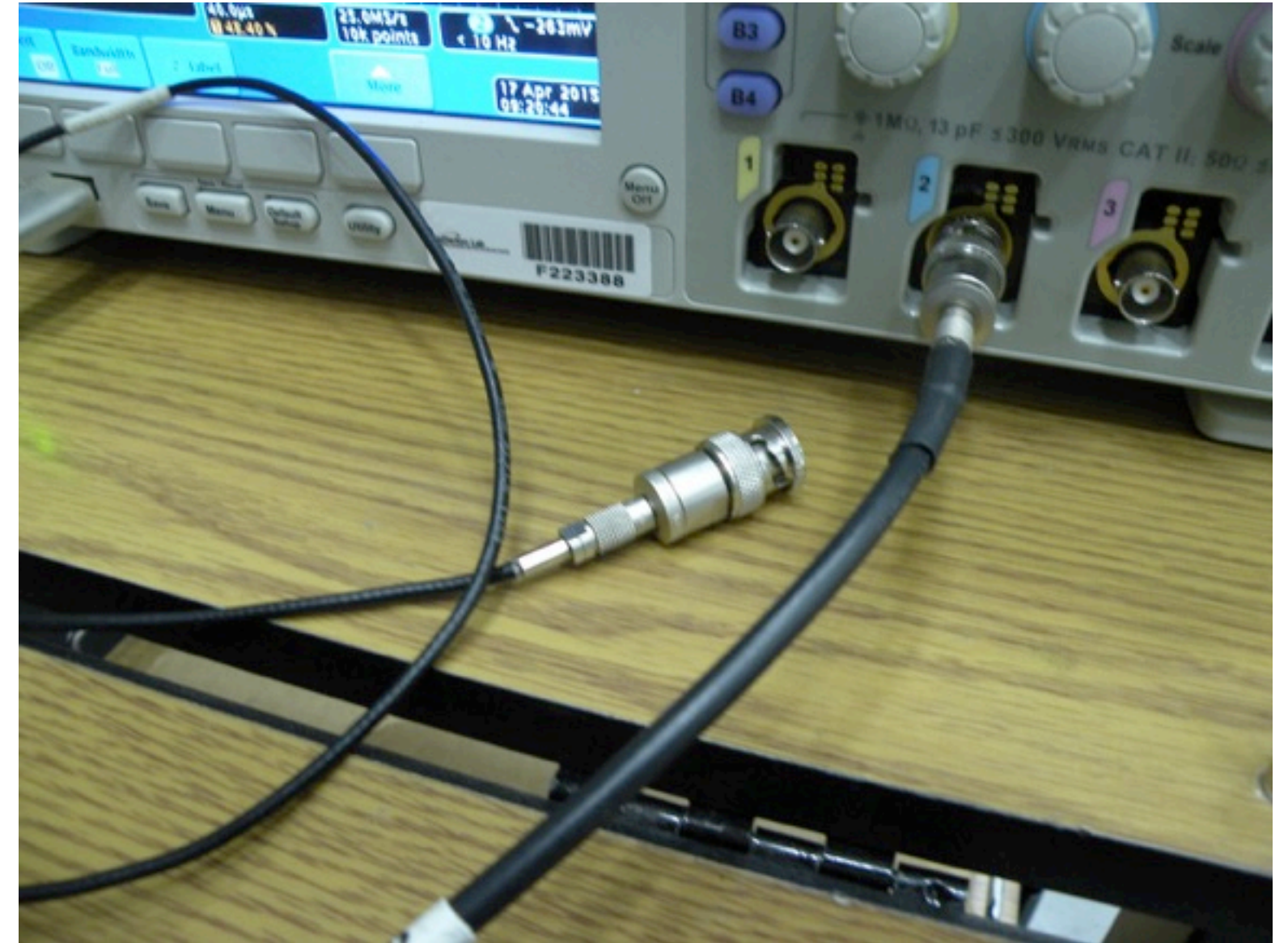
current is
determined
by preamp



New Scope



new scope from Nick



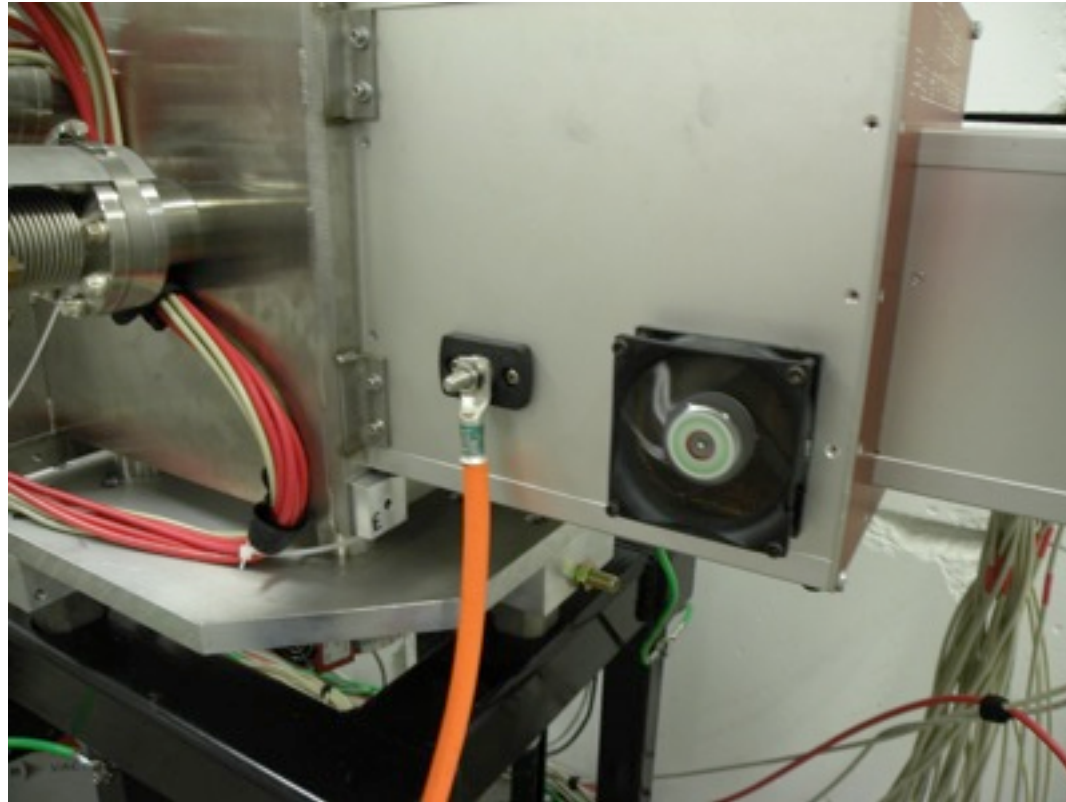
better LIM cable

- Oscilloscope may have been picking up noise in cave
- Thicker coated LIM cable also probably helps

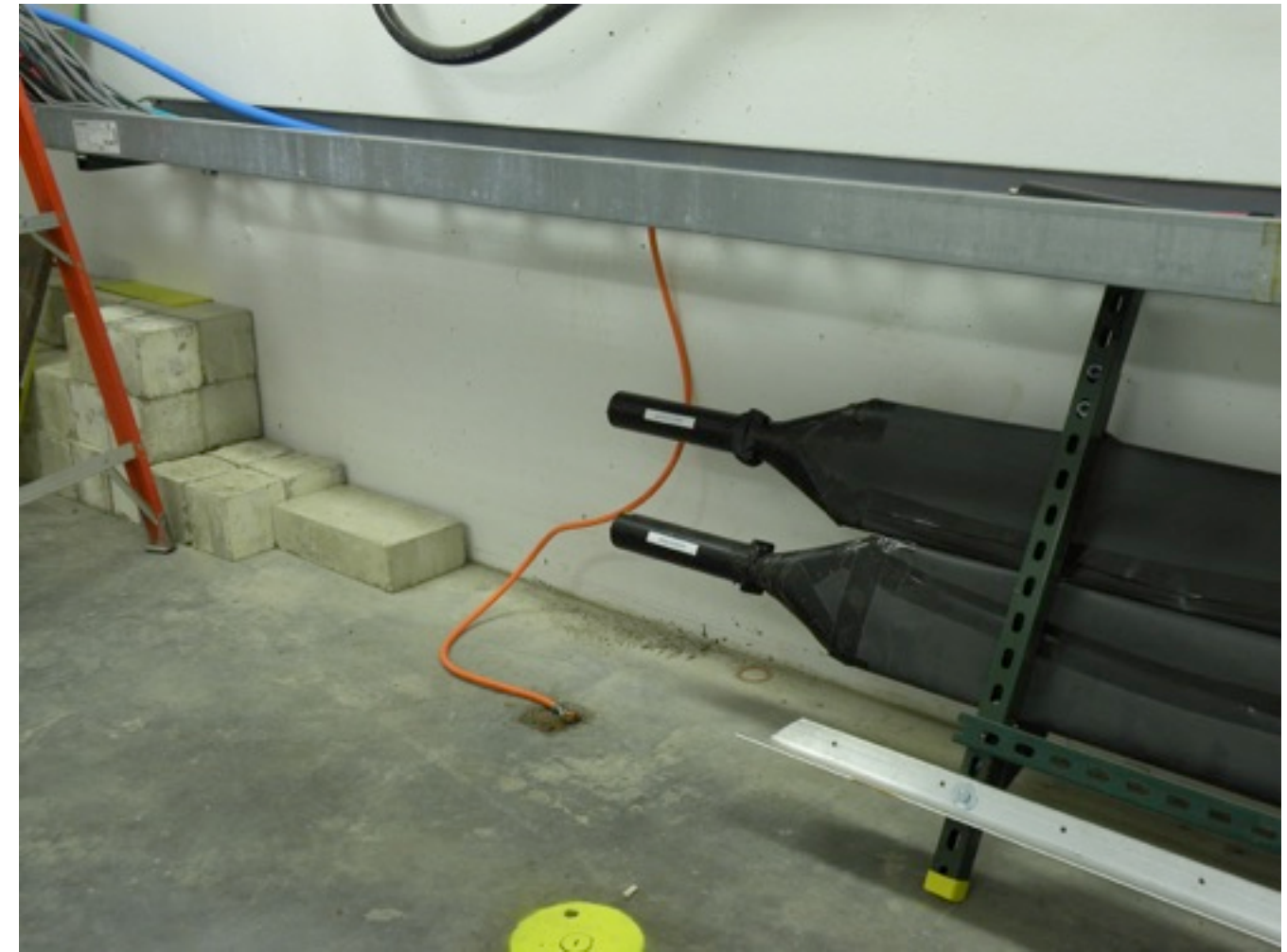
Noise



Ground connection was picking up noise



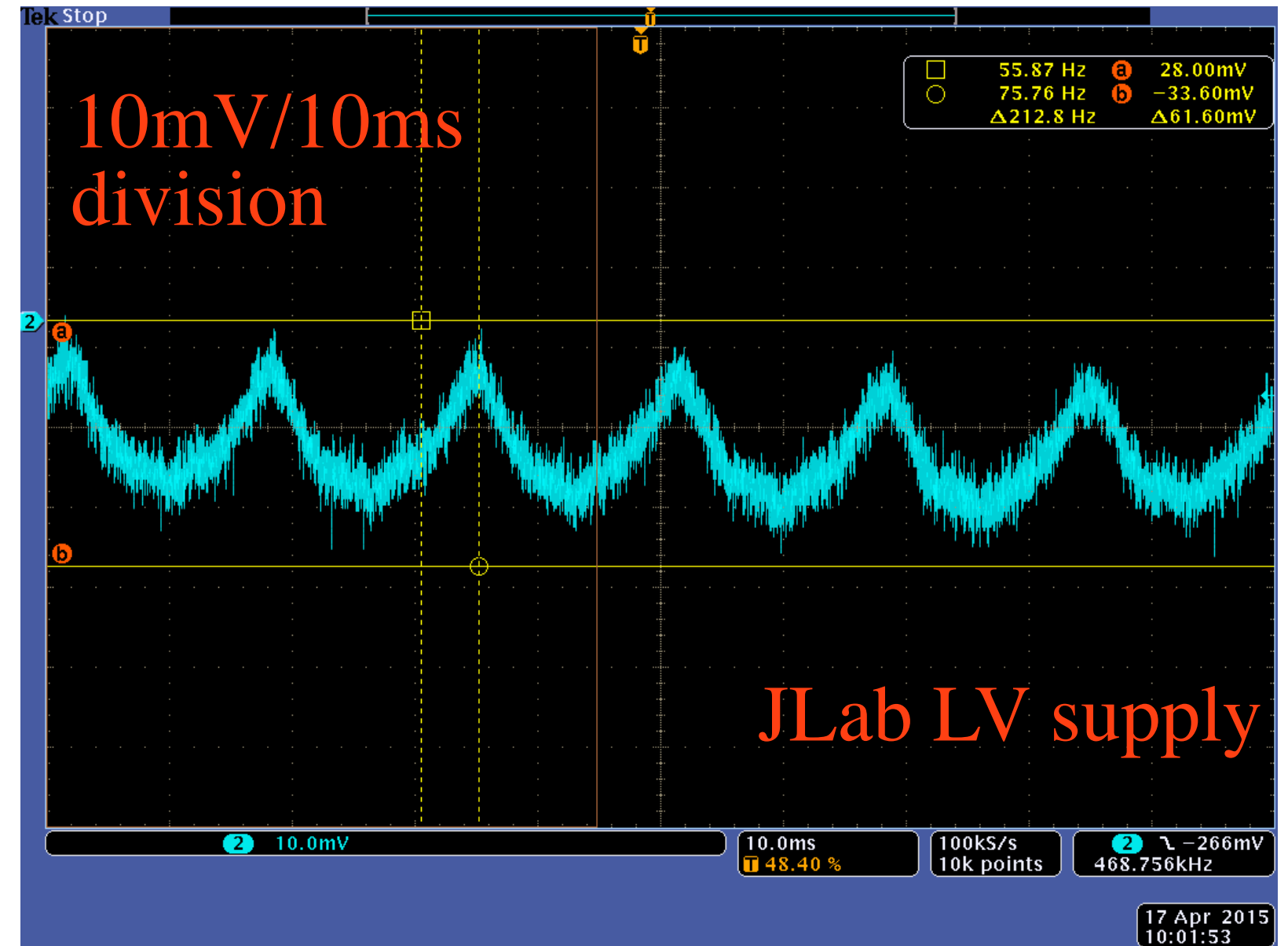
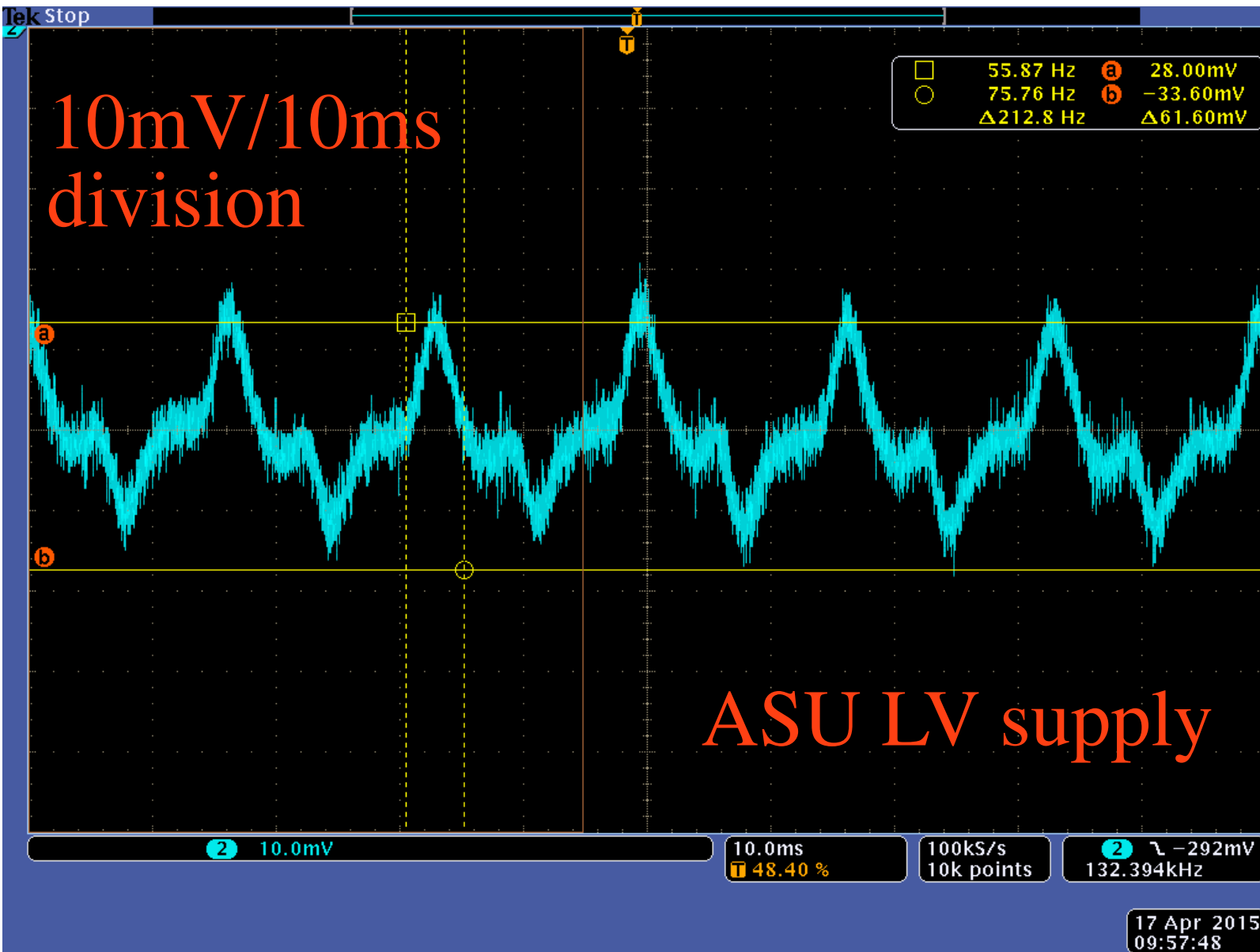
Better ground



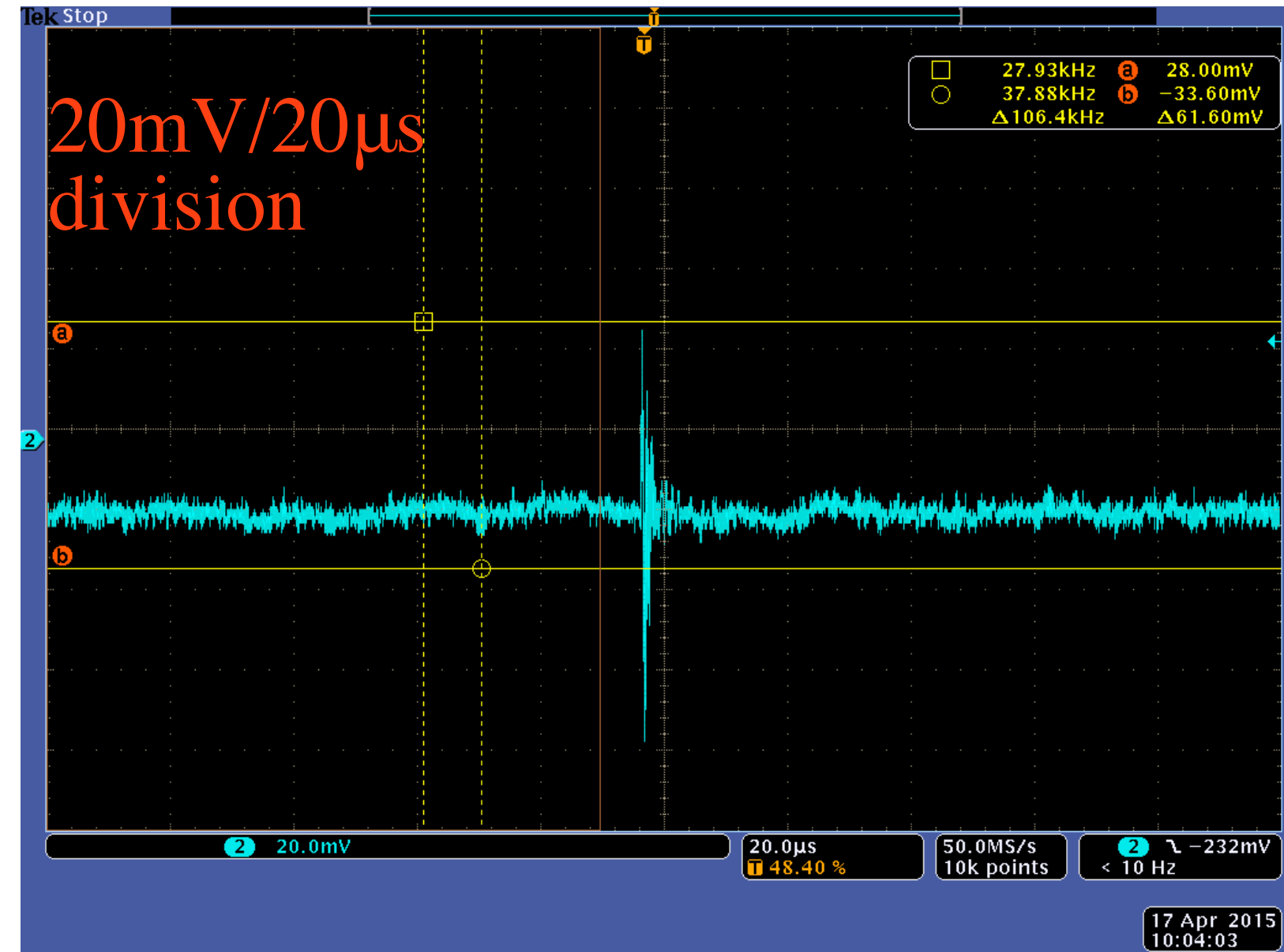
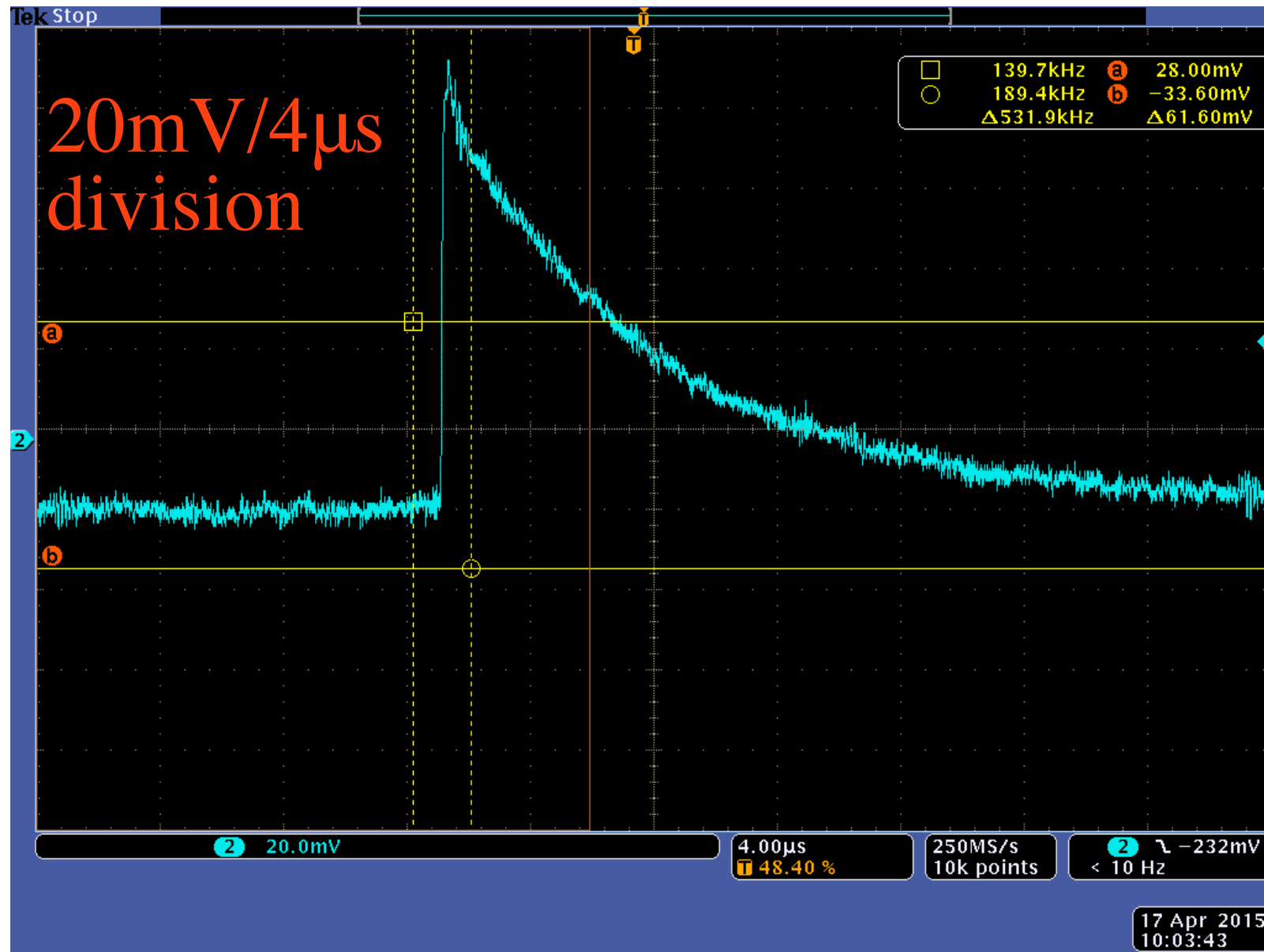
New ground position

- Even with better ground connection, if the ground cable is passed through the cable tray it picks up the 200 kHz noise

Noise Levels



Signal, Background



both with JLab
LV supply

Background Rates

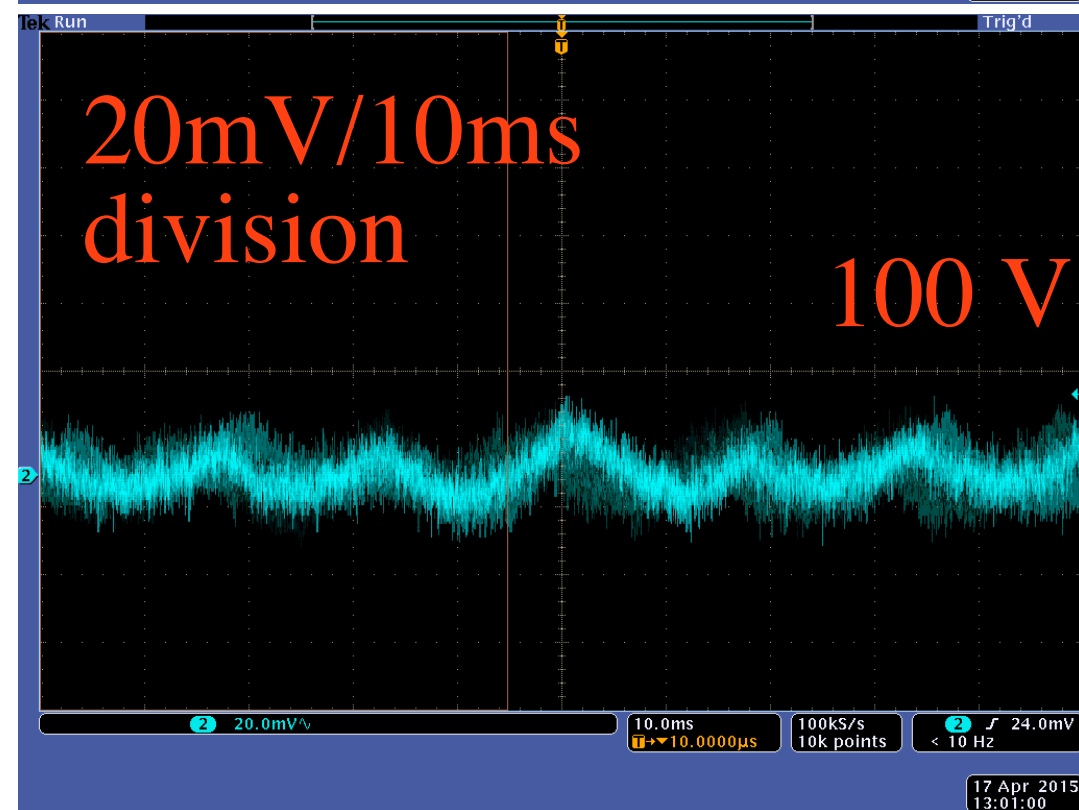
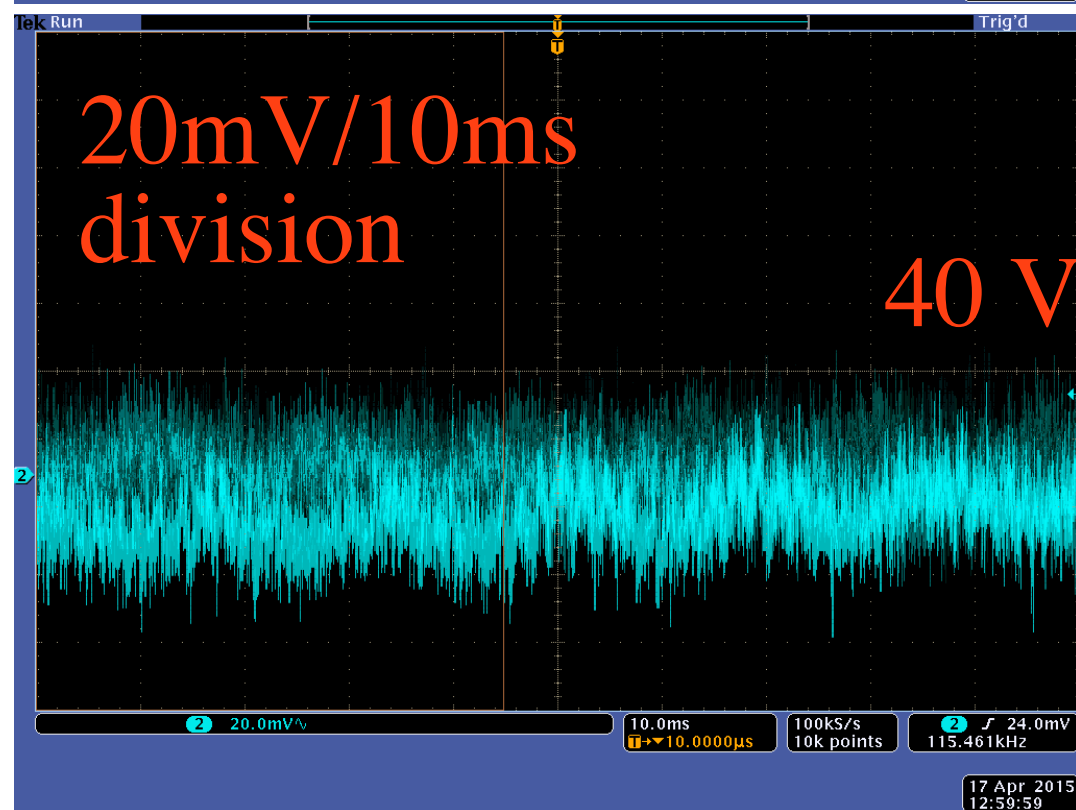
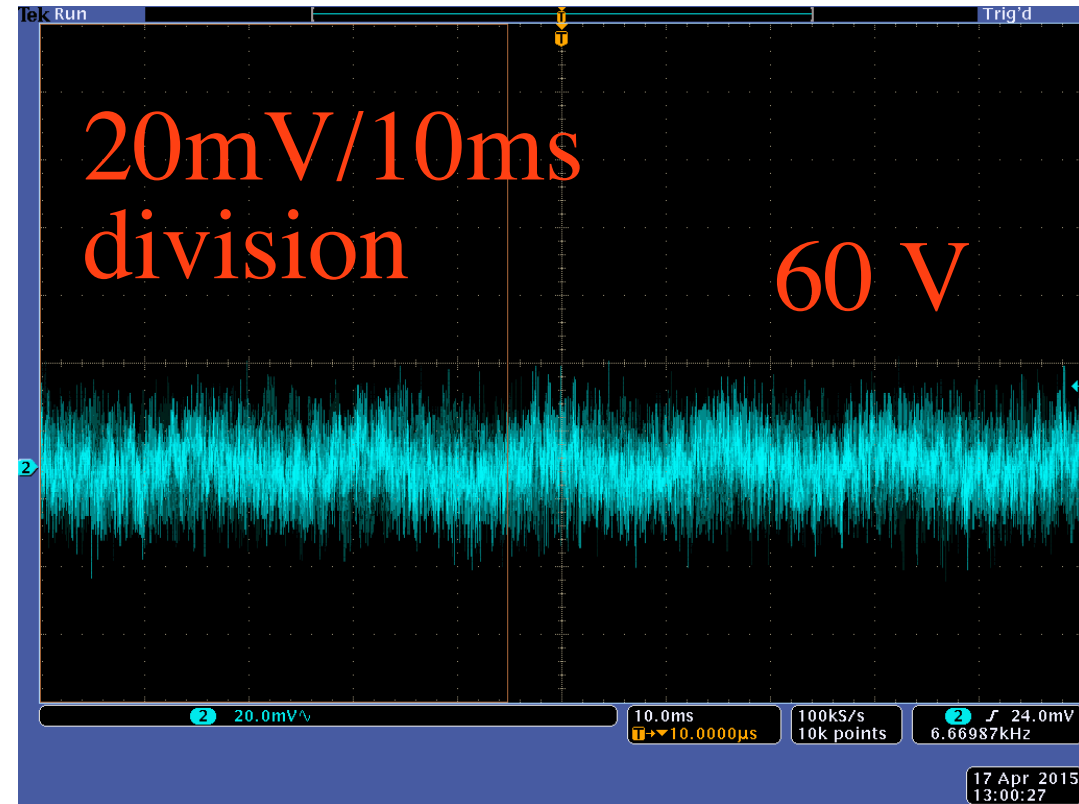
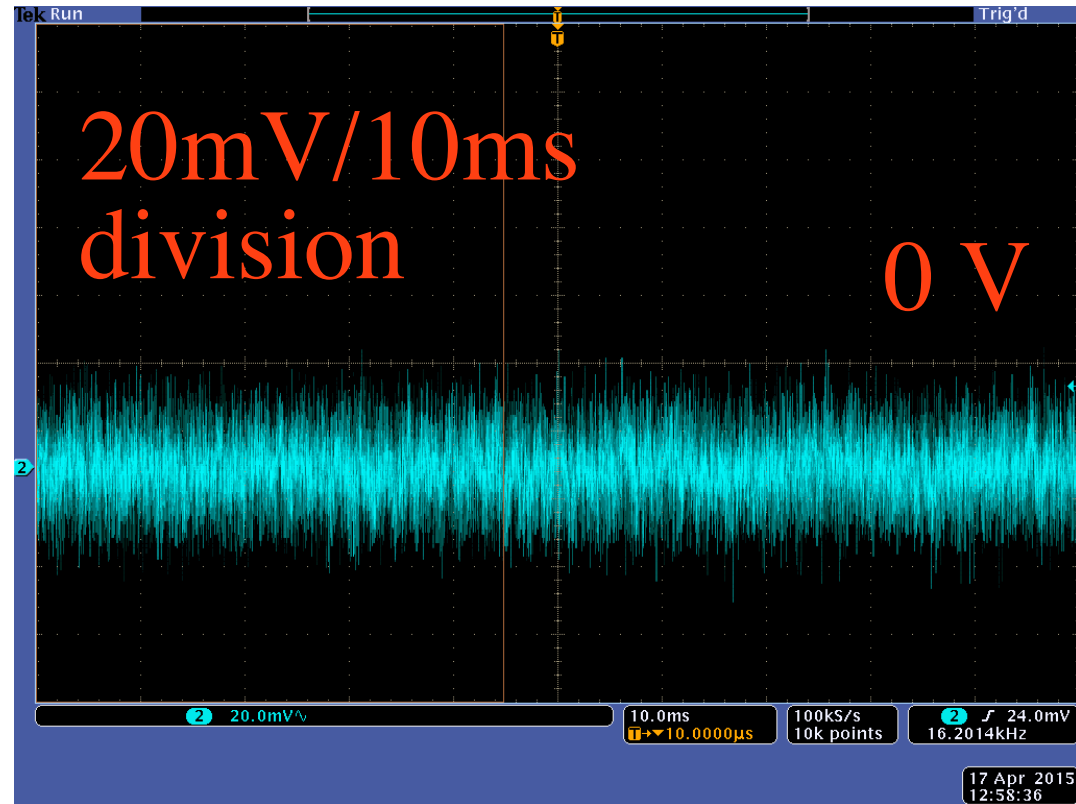
- Tested with scope connected to signal cables going into fADC
- Results will vary on channel
- Most channels have ground noise level of ~ 20 mV peak-to-peak
- Baseline oscillations are 10-20 mV, ~ 50 mV on sector 32

threshold above baseline (mV)	rate
>19	<10 Hz
18	<10 - 80 Hz
17	200-500 Hz
16	80 - 2000 Hz
14	12-23 kHz

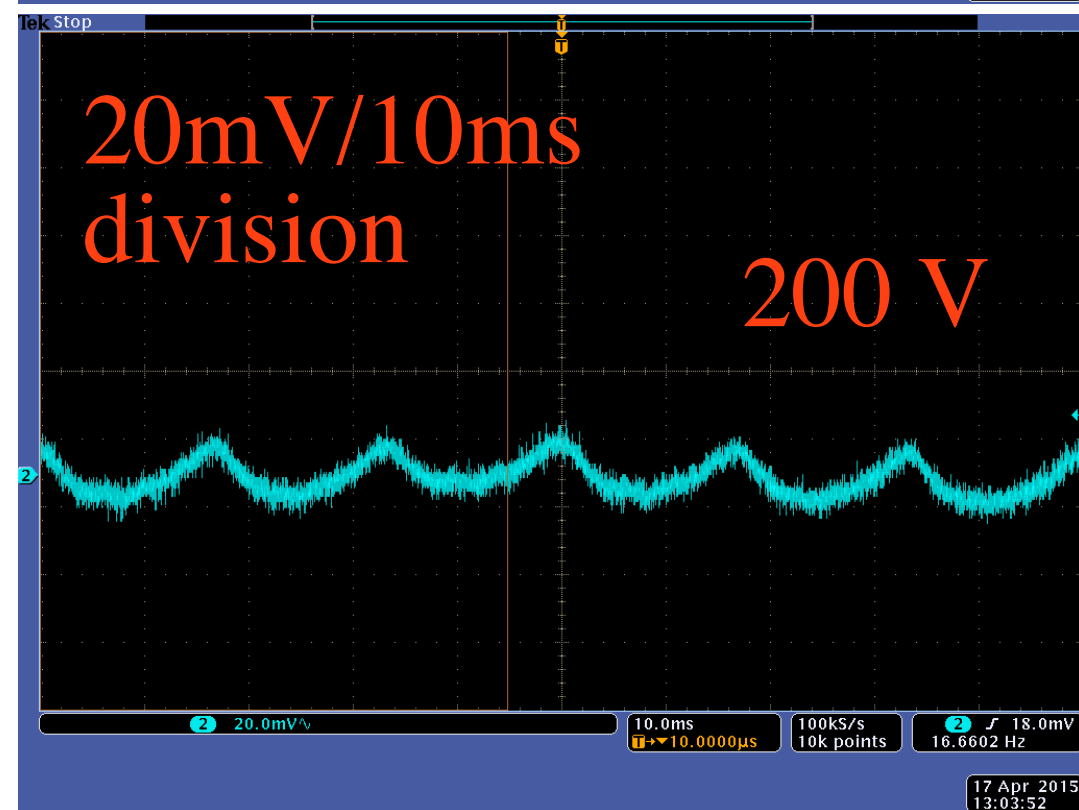
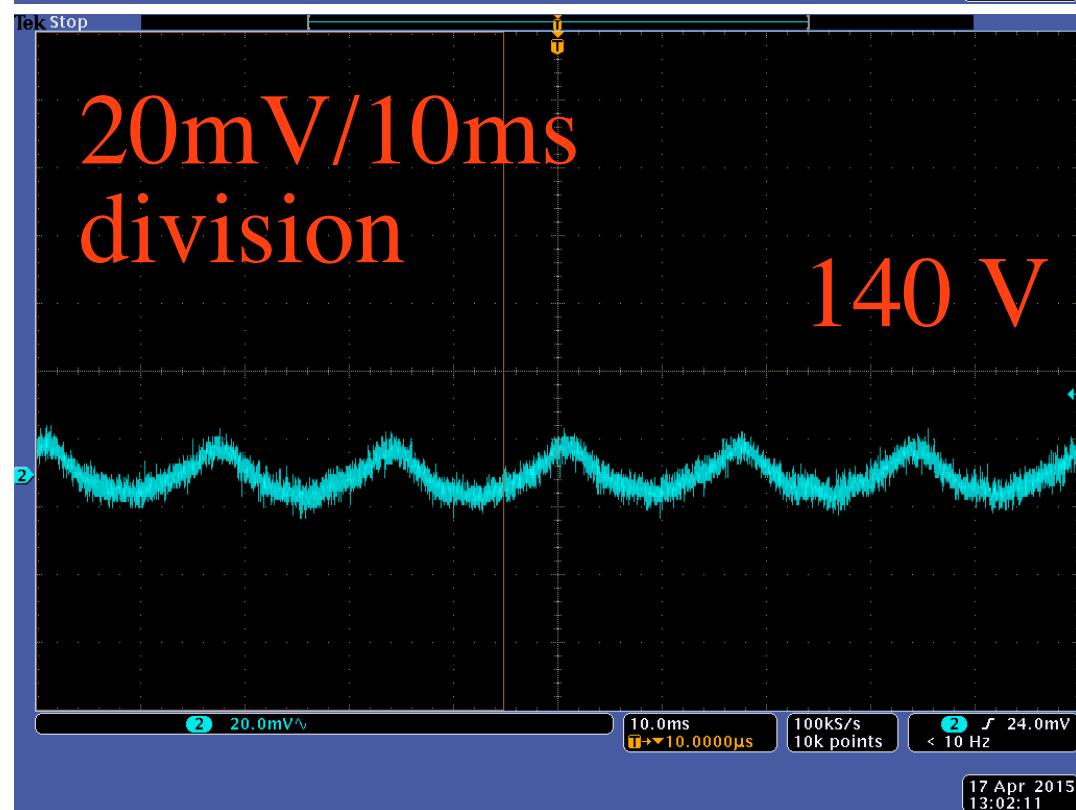
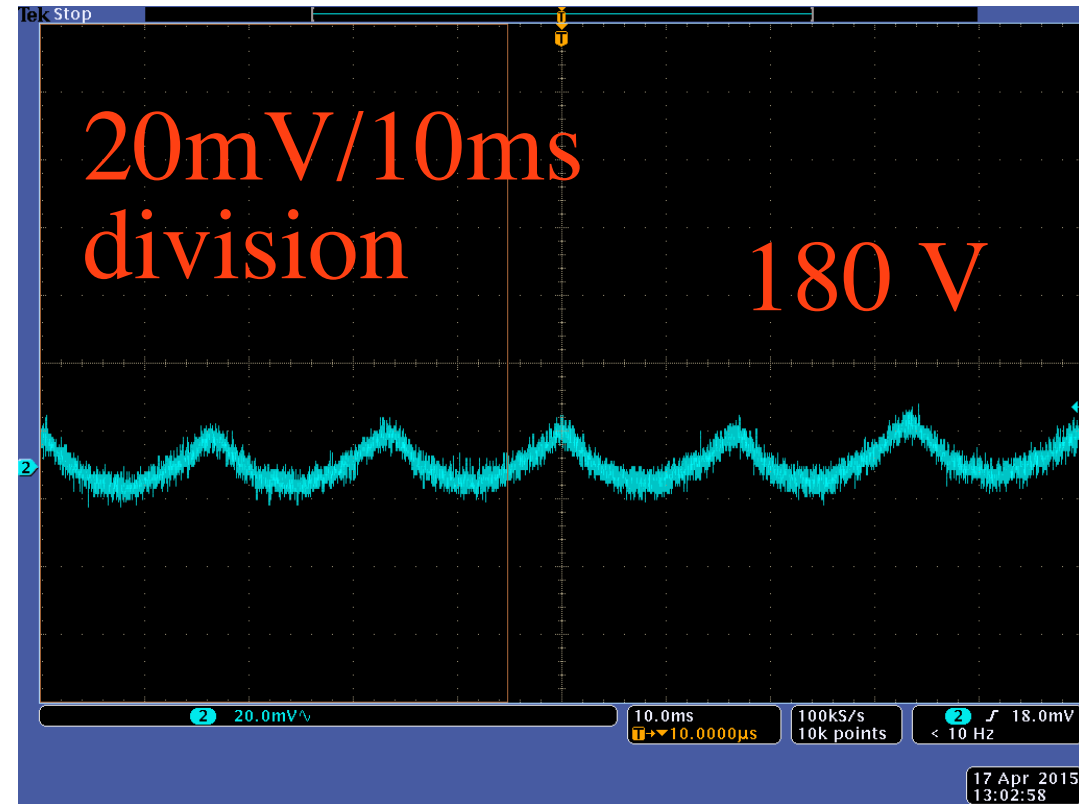
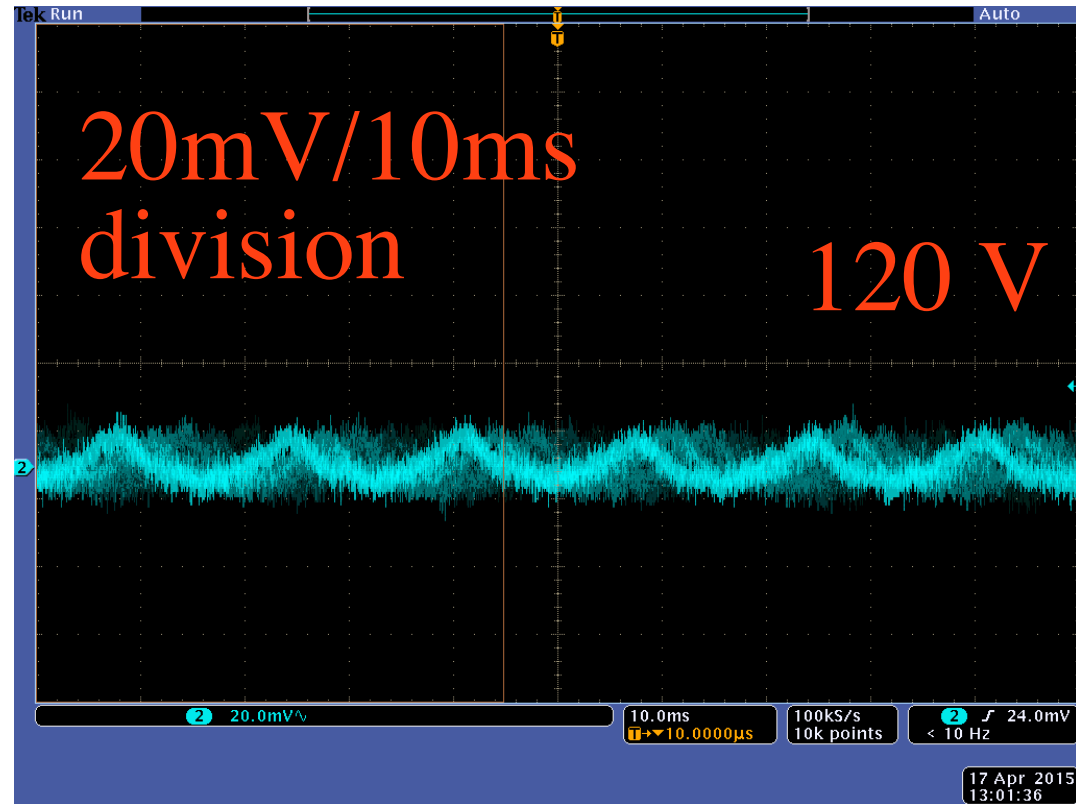
signal and jitter only

typical noise level

Noise Levels

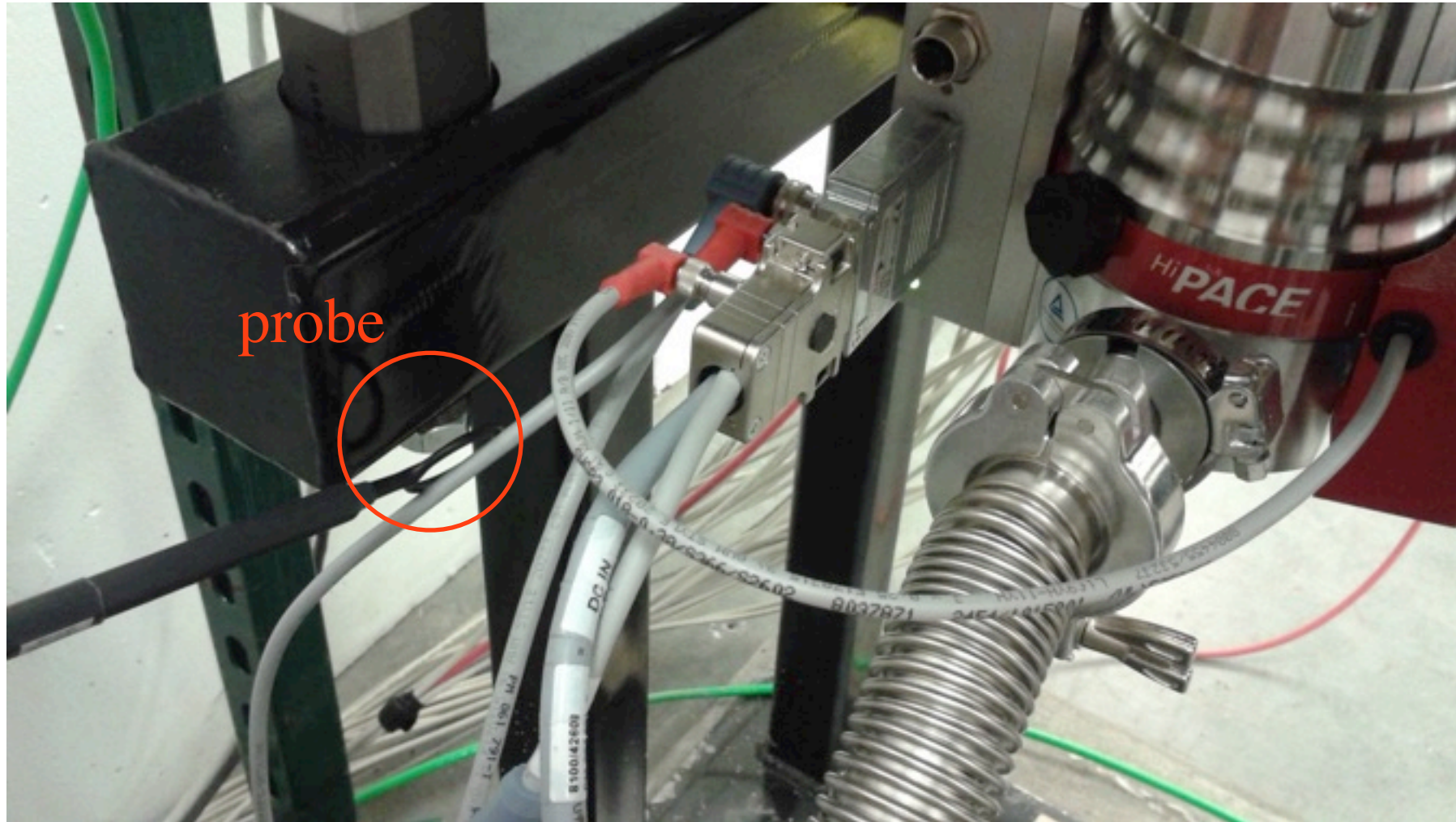


Noise Levels

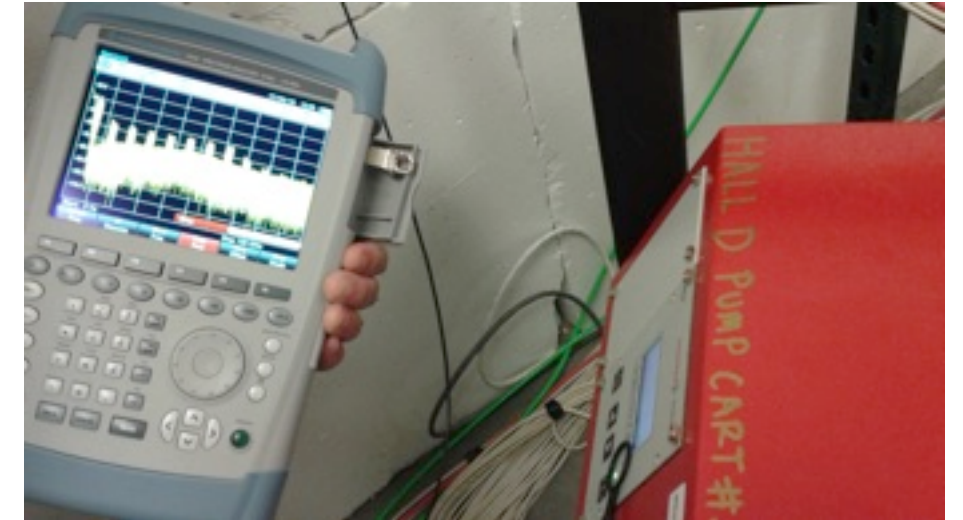


Noise Scan

- Fernando had gadget to check noise levels against frequency



rather strong high frequency noise coming from turbo pump connected to polarimeter



also from front panel of pump



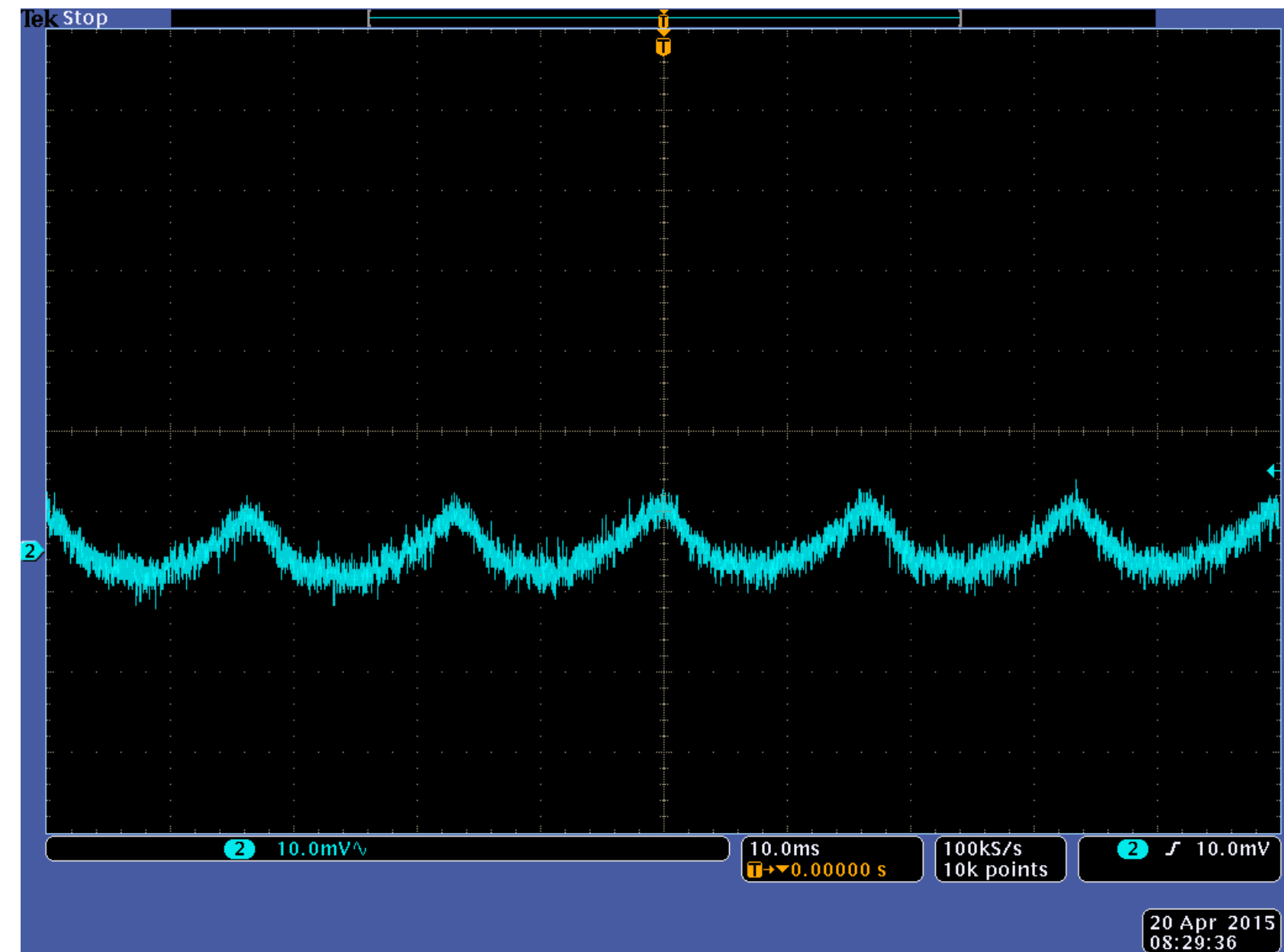
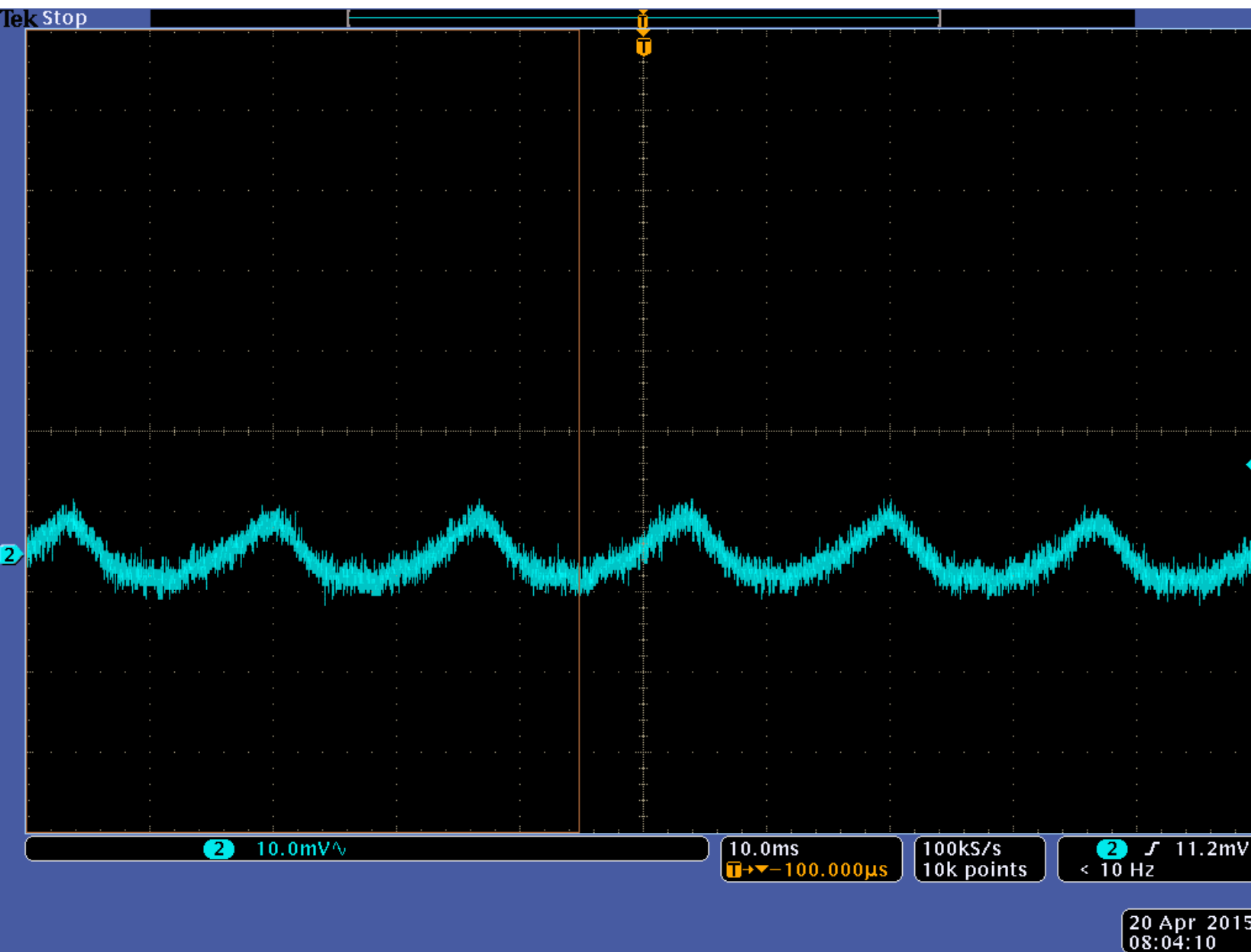
strongest (?) noise coming from cable tray

Noise With Turbo Pump On/Off

ON

10mV/10ms
division

OFF

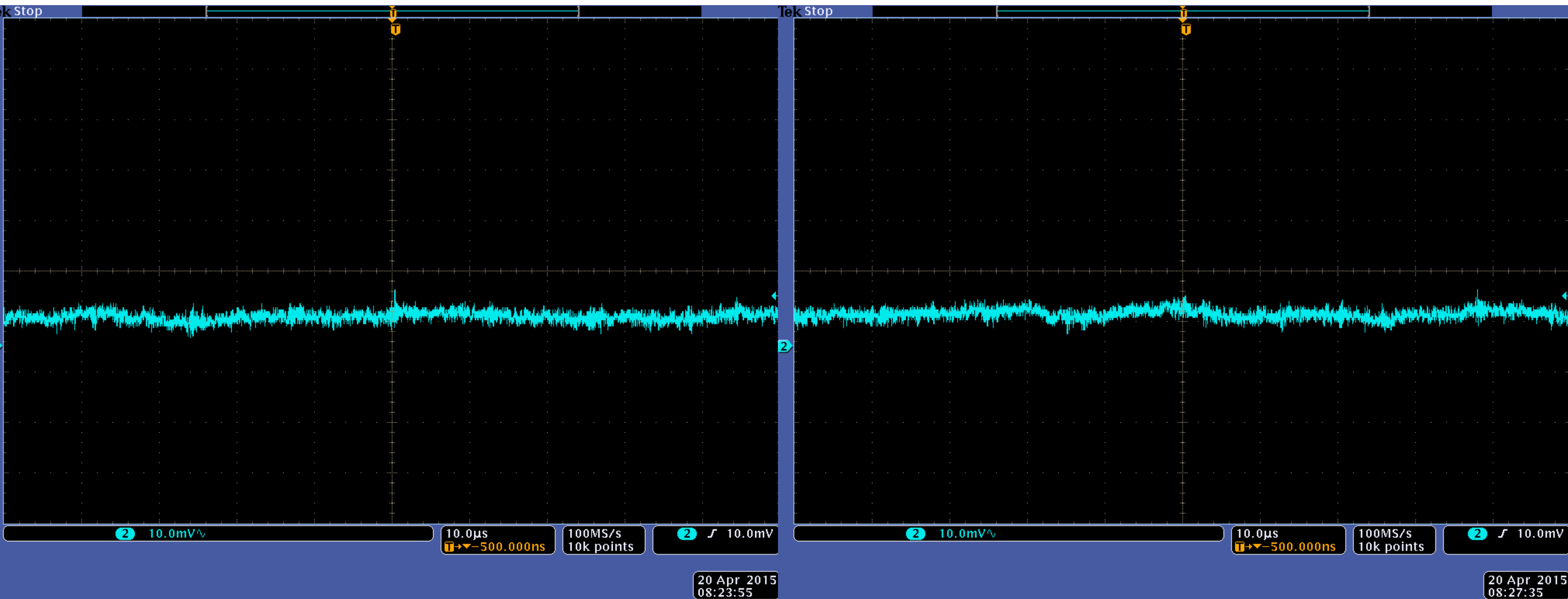


Noise With Turbo Pump On/Off

ON

10mV/10 μ s
division

OFF

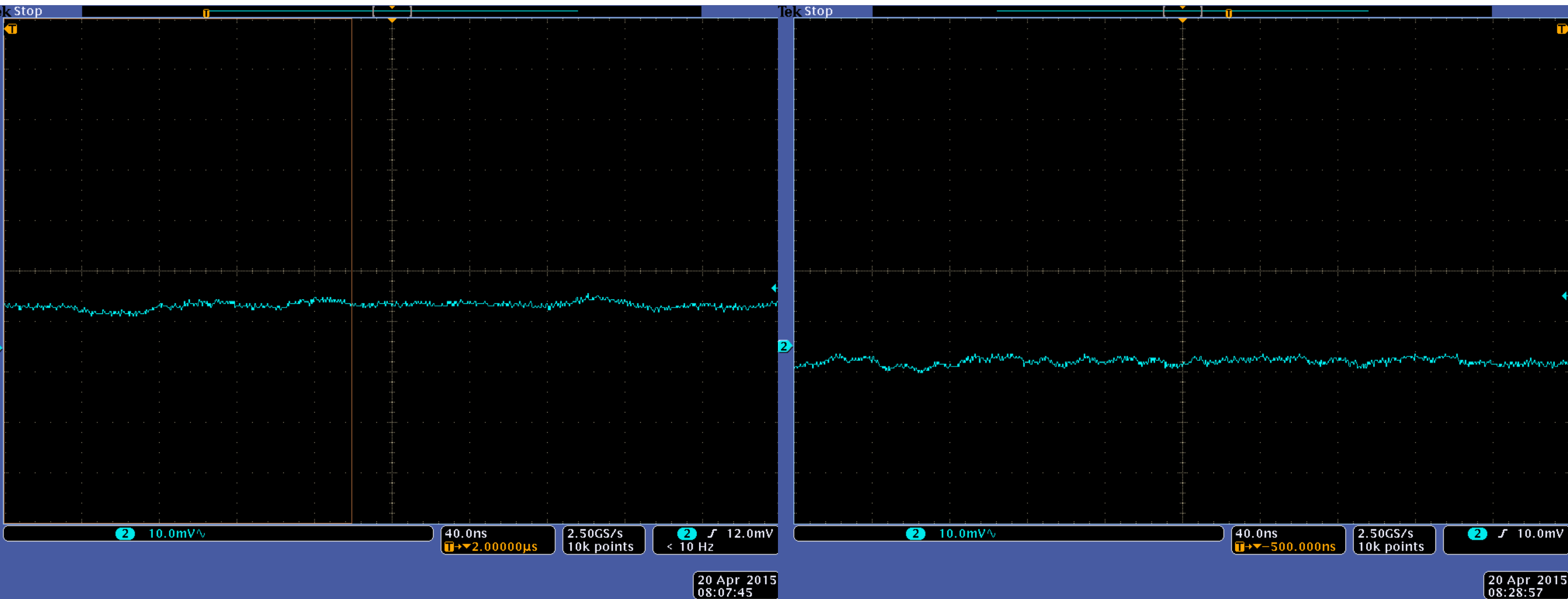


Noise With Turbo Pump On/Off

ON

10mV/40ns
division

OFF



Summary

- All detector elements installed in hall, under vacuum, HV set
- Using LV supply from JLab
- Noise due to environment, may be better once we move things around
- New HV supply in summer should decrease HV noise
- Many many thanks to Tim, Mark, Keith (engineers), Fernando, Nick, Chris (electrical), Beni, Lubomir

fADCs...

- Talked to Alexander (Sasha) Somov today (April 22)
- No configuration yet, but we should be able to self-trigger fADCs
- Polarimeter will be read out with PS trigger
- Implementing scalers (no settings yet)
- Will be worked on tomorrow, hopefully before beam