

HV Update

Update on 06/26/2015 Items

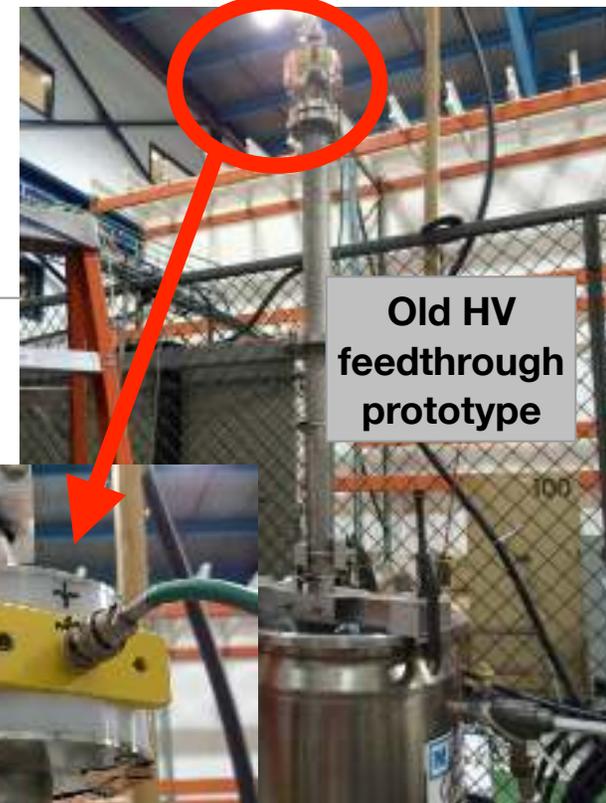
- Hans gave a talk on “High Voltage Monitoring Options”
 - He described **two independent additional monitoring** options we could add to the system
 - 1) Analog measurement of the **DC current** out of the back of the supply
 - 2) A device to detect small discharges — **fast changes in current**
 - Both would be additions/improvements to our working system

Item 1: DC Analog Read Back of the Current

- We use a box from the company to control and monitor the power supply
 - The current readback with this box is only $\sim 12 \mu\text{A}$
- The power supply also has ***analog*** control and readback on the back of the supply
 - In an effort to better measure the current, one can monitor the analog output. (earlier talk used this)
- The supply is not designed to have both interfaces active at the same time. When the box is also plugged in, the analog output drops. With similar noise, our resolution is a bit worse.
- Sowjanya interfaced to a Keithley multimeter and got this value into the slow controls (!)

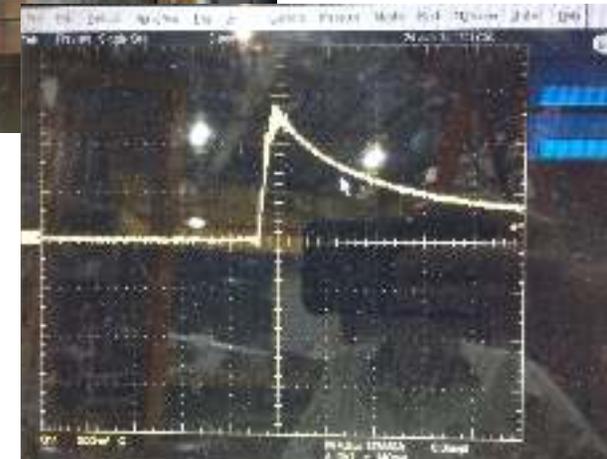
Item 2: Current Pulse Monitor

- The purpose is to detect fast changes in the cable's current
 - A similar device has been used in other experiments (ICARUS) to “watch the cable relax during ramp up”
 - **We have seen no evidence of “precursors” with this or any other device**
 - The scope picture is from a discharge in air to a sharp point
 - The pulse *is* the spark
- This device fit a modified cable at D0 — it would not fit the cable we use on uB
 - I postponed getting it approved for the 10 kV ramp
 - The shop was able to fast-track the modifications needed to work at uB, and the device will now work with our cable
 - Plan to incorporate it for the 64 kV ramp



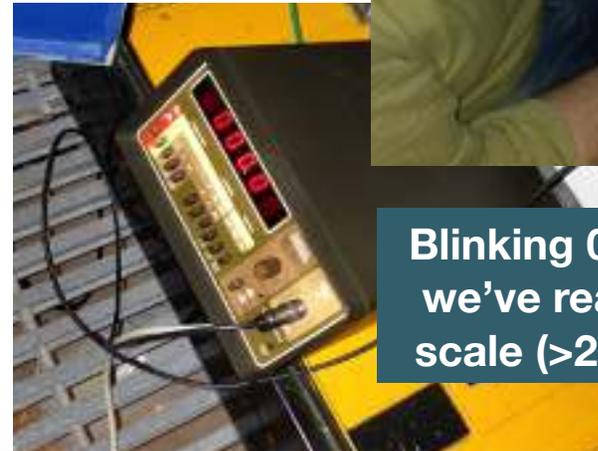
Old HV
feedthrough
prototype

Pictures from
Hans' talk

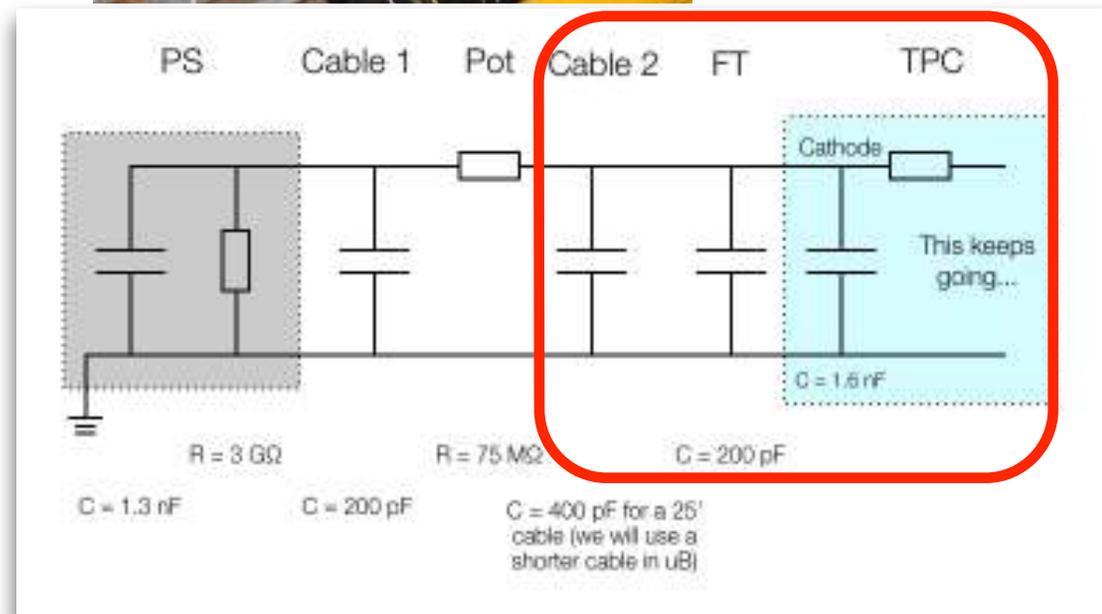


Tests This Past Week

- Followed the procedure outlined in docdb 4518 for a 10 kV ramp
- Stopped at 1 kV
 - Saw differing behavior from the continuity test. Voltage at the pickoff point seemed to decay to zero
- Recreated the continuity test and saw the same behavior
- Stopped the test
- Got Walter to measure the resistance from the feedthrough cable to ground —> Appeared open
- Walter then measured the capacitance, and there was evidence that the disconnect was at the feedthrough/cathode connection
 - Measured 1 nF

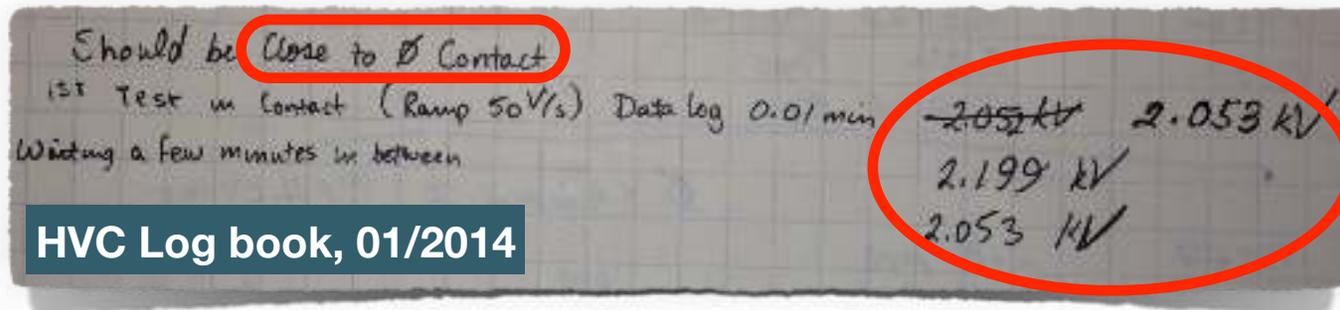


Blinking 000 means we've reached full scale (>200 GOhm)

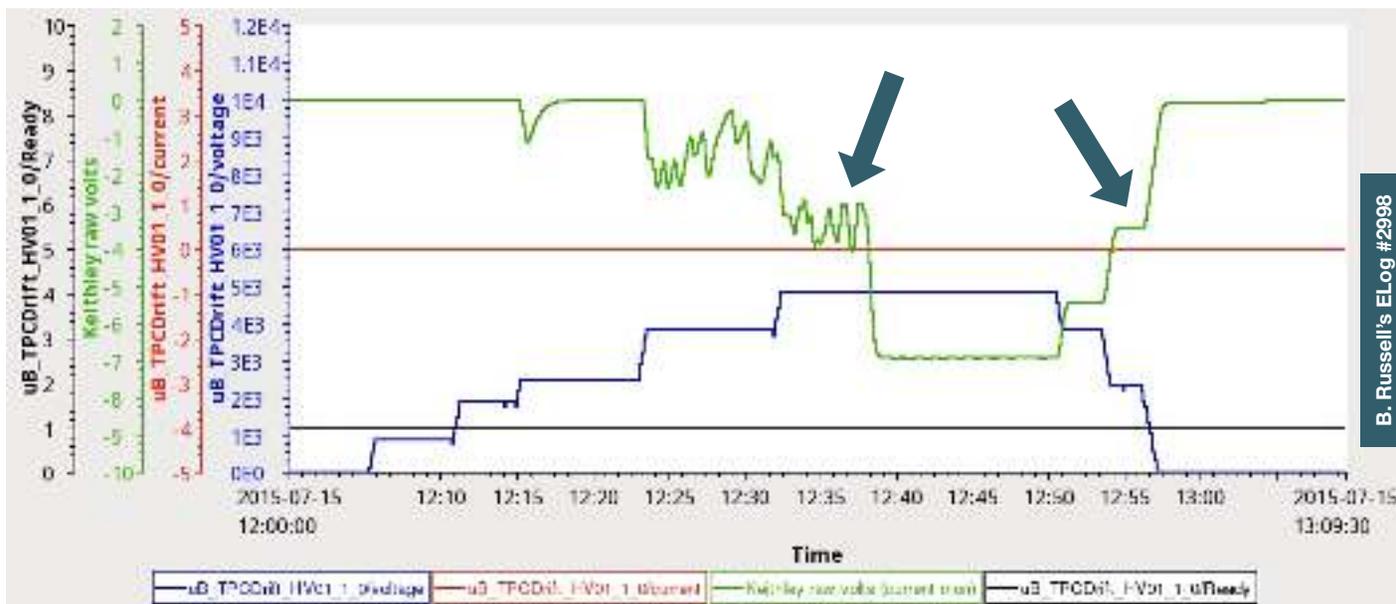


Tests This Past Week

- We had seen a non-zero conduction value for conductors in contact before:



- Discussed with the commissioning leaders and team and decided to go to 5 kV
- Saw non-constant voltage values at the pick off point until we were stable at 5 kV.



Plan

- Plan to do the 10 kV test
- Get the pulse current monitor through an EDR and put it on an additional cable
- Ramp to 64 kV following the procedures in docdb 4518
- Please order a new Keithley