

Xe-doping preparations

Cryogenic tests

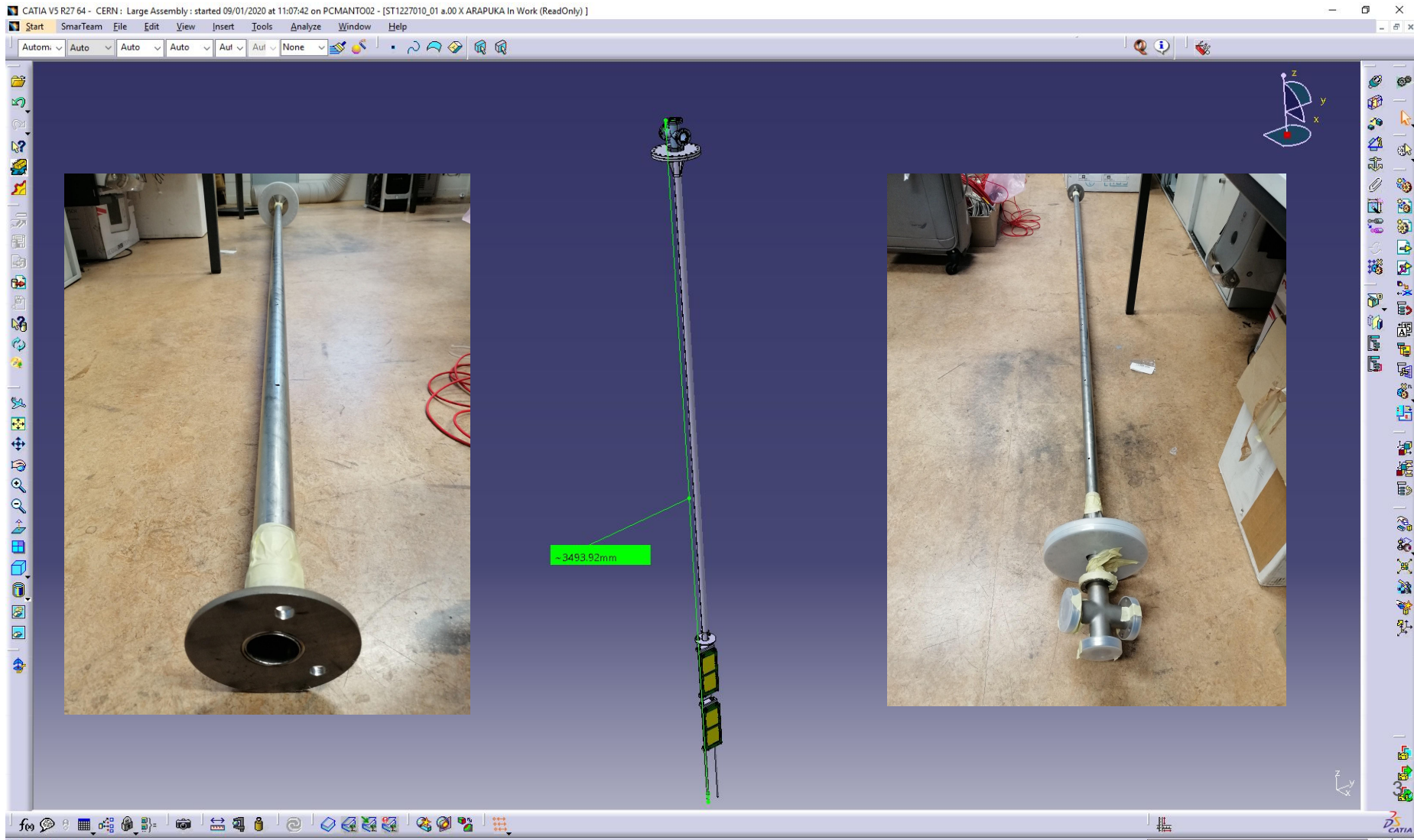
300 kV power supply

F. Pietropaolo, F. Resnati, S. Tufanli

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Xe-doping preparations

Mechanical support structure is ready!



Documentation, preparations ...

- Safety procedure has been finalized and the operation has been approved
 - First remove the camera and acrylic tube. Then close the port with a blank flange
 - Monitor the purity during/after this operation
 - Prepare PD detectors and structure at EHN1
 - Mount detectors to the support structure
 - Perform cabling
 - Test them at room temperature
 - Integrate the new detectors into the current SSP system
 - The week after the collaboration meeting, insert the structure into the cryostat

Cryogenics tests

Cryogenic tests this week

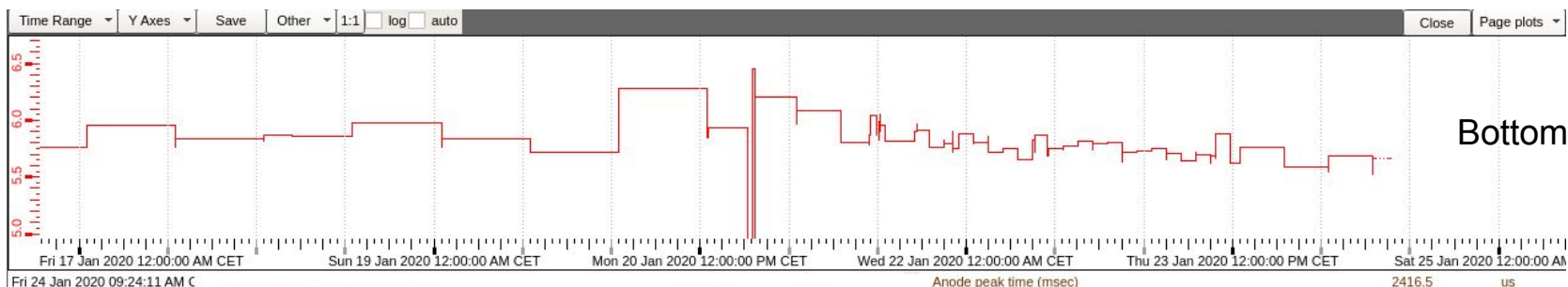
Test electron lifetime when cryostat cooling and re-circulation is off!!

- Starting on January 21st, at 10:58:
- Steps to stop the liquid argon pump and vent the argon boil off:
 - Set the venting valve regulation pressure to ~2 mbar above the actual relative pressure with respect to the atmosphere.
 - Close the nitrogen inlet to the condenser (liquid nitrogen level in the condenser reduces).
 - Wait that the nitrogen evaporates completely also from the pipes of the heat exchanger (nitrogen pressure in the condenser starts decreasing).
 - Argon pressure in the cryostat increases till the vent valve opens (~2 mbar).
 - Argon pressure in the condenser increases, reaching the cryostat pressure (no more vapour flow from the cryostat to the condenser).
 - Liquid argon level in the condenser decreases (argon goes into the cryostat for gravity).
 - Since the height of the liquid argon output from the condenser does not allow to empty it completely, it's decided to close the output of the condenser (input to the LAr circulation) to avoid that the column of not purified argon returns into the cryostat (the liquid argon in the condenser evaporates and is exhausted through the vent of the cryostat).

Stop the liquid argon pump. Close its input and leave the output open to let evaporate the liquid argon in the circuit.

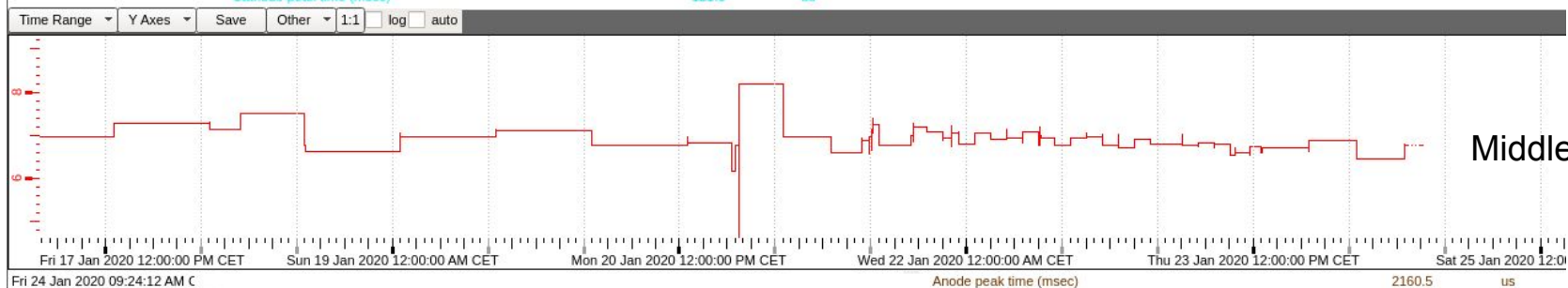
This operation took a bit more than 1h. The measurements from the purity monitors were not affected significantly after ~1h from the stop of the pump.

Lifetime and special cosmics runs



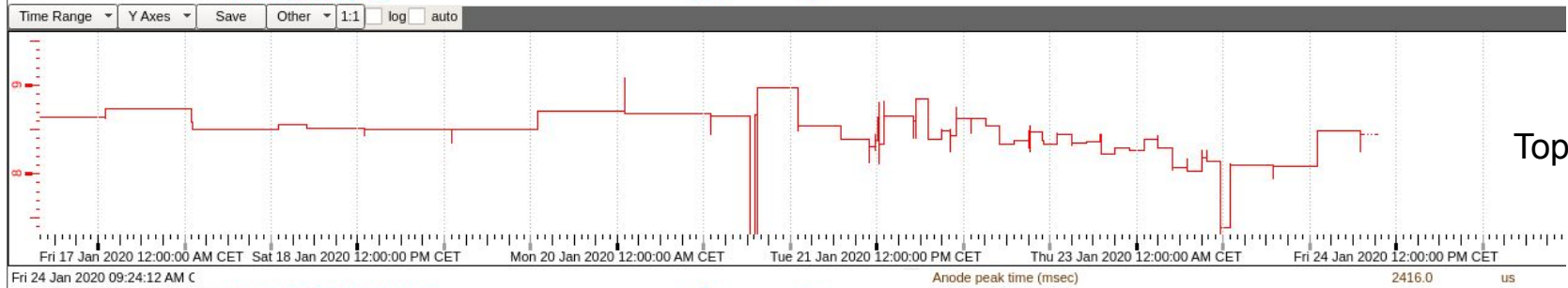
Bottom PrM

Corrected electron lifetime (msec) 5.70 ms
 Electron drift time (msec) 2295.0 us
 Cathode peak time (msec) 121.5 us



Middle PrM

Corrected electron lifetime (msec) 6.78 ms
 Electron drift time (msec) 2038.5 us
 Cathode peak time (msec) 122.0 us

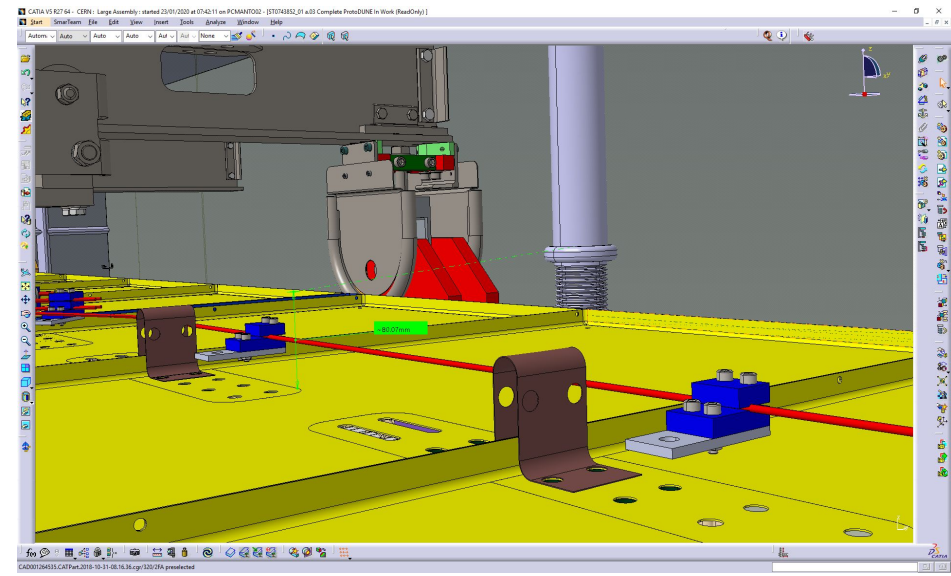
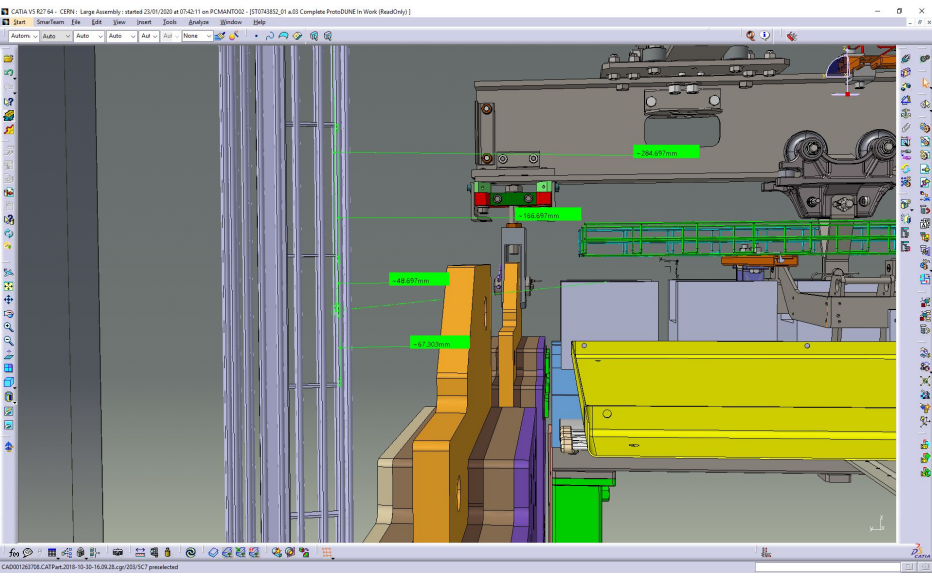
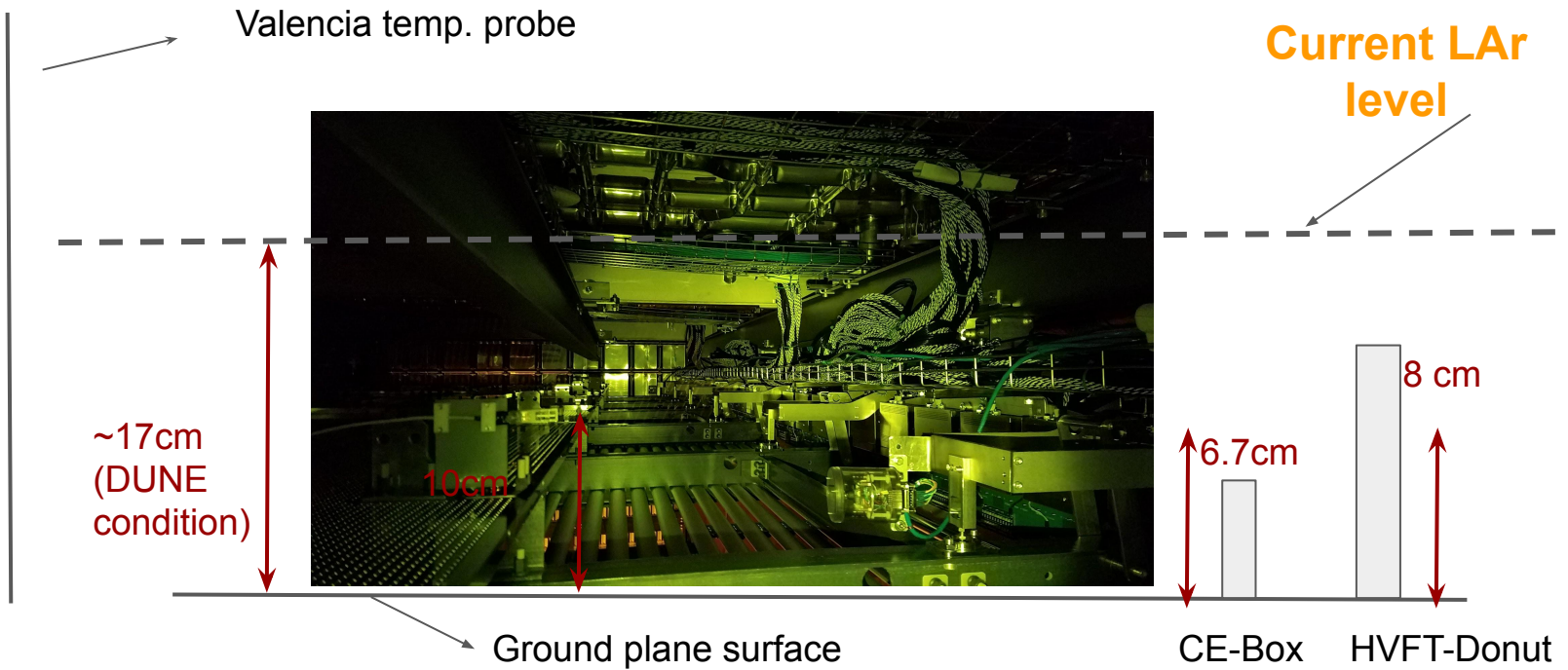


Top PrM

Corrected electron lifetime (msec) 8.45 ms
 Electron drift time (msec) 2282.5 us
 Cathode peak time (msec) 133.5 us

LAr level !!





We'll continue during the weekend but will turn off the HV on Saturday night/Sunday morning

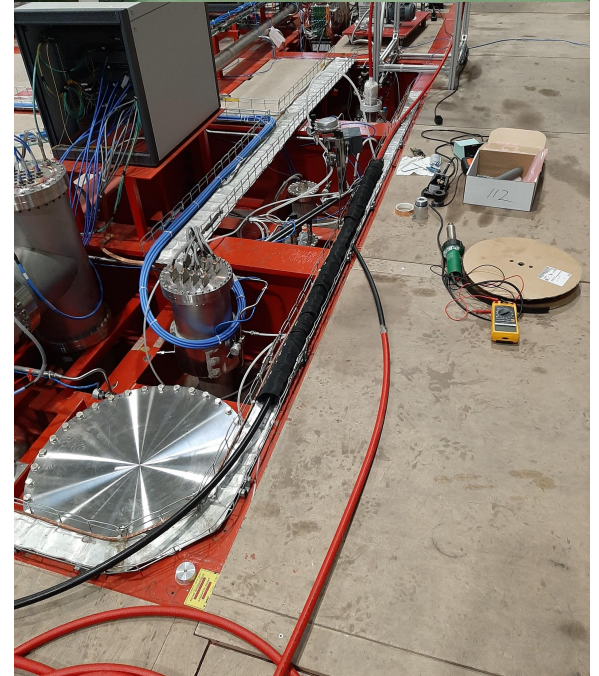
Cosmics runs during the cryogenic test

- During cryogenic tests we collect two sets of data
 - Cosmics with CRT trigger
 - Generally ~15Hz CRT + 1Hz random with all detector components
 - Low rate random trigger long runs
 - 1 or 2 Hz random trigger, mostly with only CEs
- “AFTER Beam Run” spreadsheet will be updated with the list of runs we took during the tests

300 kV high voltage power supply

300 kV PS refurbishment

- We had the original 300kV ProtoDUNE-SP high voltage power supply refurbished
- Quickly tested its performance after the delivery
 - Connected to the HV noise filter
 - Connected to the DCS for monitoring purposes
 - Ramped up to 180kV and monitor the stability





Current [uA]	132.8945	uA	Voltage Raw [V]	185178.5	V
Voltage [V]	185178.5	V	HV Voltage Cmd [V]	160.07	uA
Current Limit [uA]	160.07	uA	Levelmeter (V)	250.00	MOhm
Current Trip [uA]	250.00	MOhm	Resistance [MOhm]		

Looks better than before!! Need to check more in details with correct DCS setting!!



Current [uA]	132.8224	uA	Voltage Raw [V]	185172.71	V
Voltage [V]	185172.71	V	HV Voltage Cmd [V]	160.07	uA
Current Limit [uA]	160.07	uA	Levelmeter (V)	0.007	MOhm
Current Trip [uA]	250.00	MOhm	Resistance [MOhm]	1302.99	MOhm