

# LArFCS Cryogenic System Progress

Yichen, Sergey

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# LArFCS Construction

## ▸ PrM progress at UCI

- Problem located for our PrM
- One capacitor at the 12V NIM module power supply broken on the electronics box, fixed
- Replaced fresh photocathode on our PrM, result quite good
- Travel application submitted, plan for visit the week after Thanksgiving: 11/30-12/3



# LArFCS Construction

## ► Fresh photocathode test in Vacuum

- Signal amplitude improved significantly, saturated

Testing in vacuum

Old photocathode

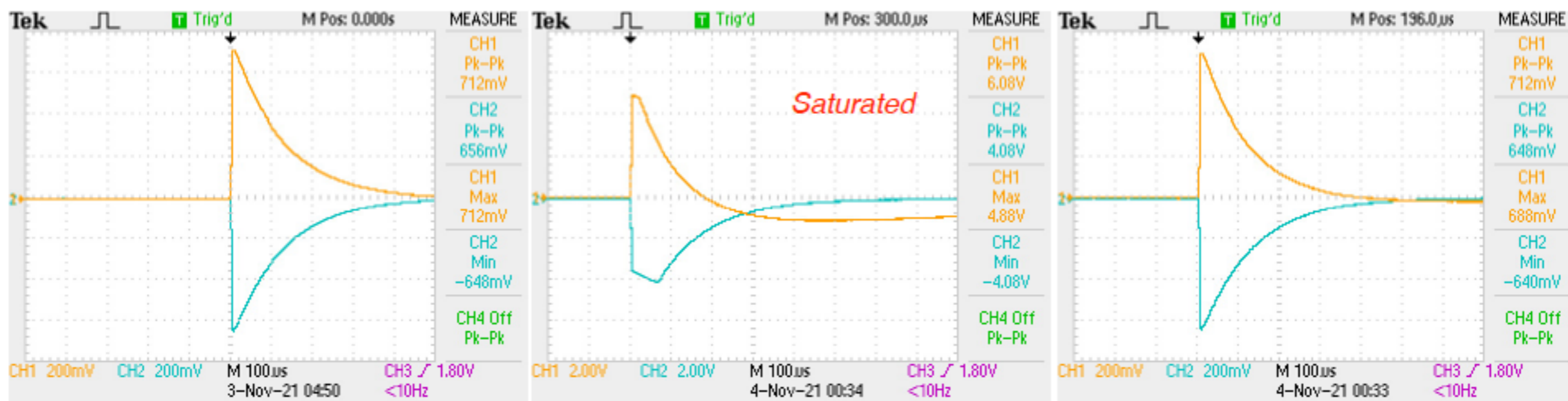
$V_{\text{cathode}} = -50 \text{ V}$ ,  $V_{\text{anode}} = 1000 \text{ V}$

New photocathode

$V_{\text{cathode}} = -50 \text{ V}$ ,  $V_{\text{anode}} = 1000 \text{ V}$

New photocathode

$V_{\text{cathode}} = -10 \text{ V}$ ,  $V_{\text{anode}} = 200 \text{ V}$



	Anode Peak (mV)	Cathode Peak (mV)
Old Photocathode (-50, 1000) V	712	648
New Photocathode (-50, 1000) V	N/A	N/A
New Photocathode (-10, 200) V	688	640

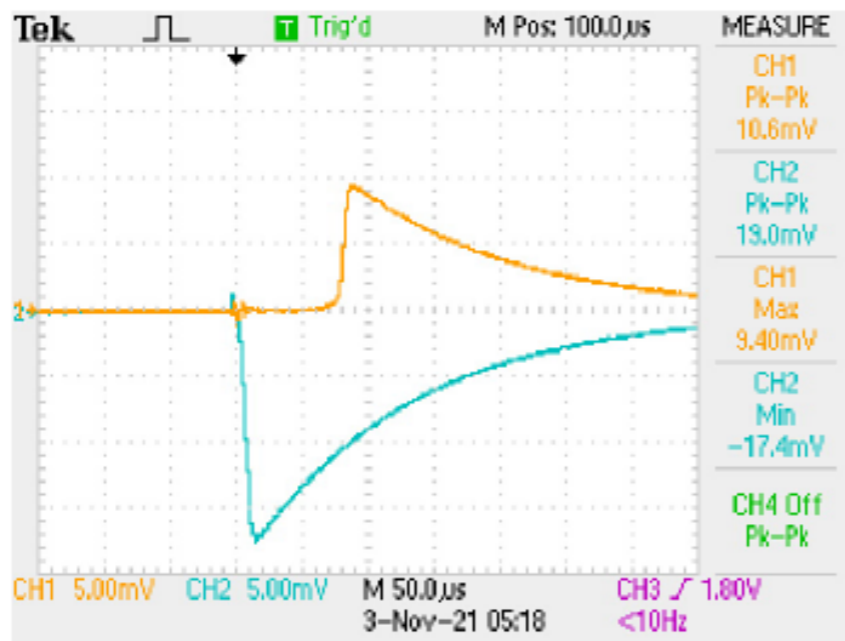
# LArFCS Construction

## ► Fresh photocathode test in GAr 1.5 bar

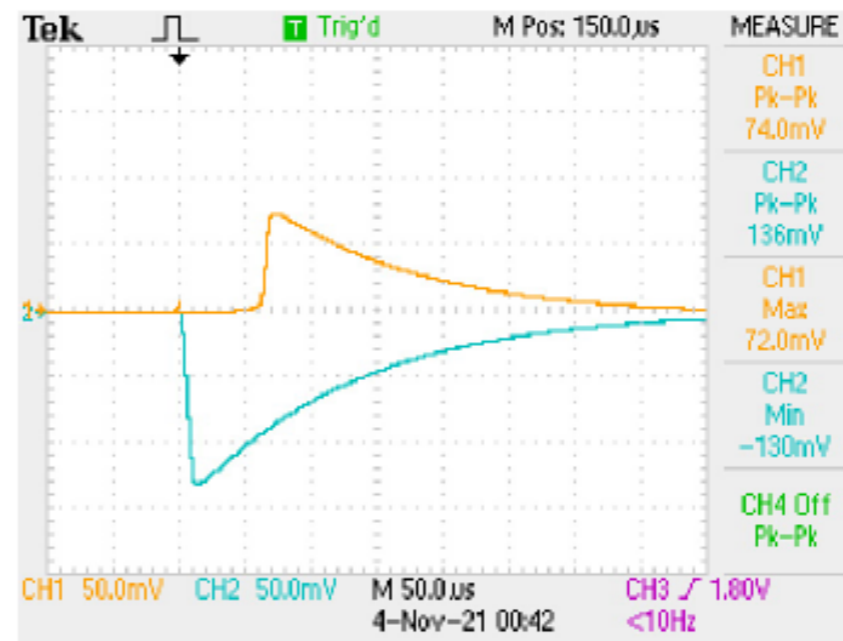
- Signal amplitude increased by 7-8x
- Previous results, Hamamatsu Xeon lamp produced about 15x more signal
- Our Xenon light source is expected to get about half of Hamtsu. signal amplitude, test in progress

Testing in argon gas,  $V_{\text{cathode}} = -50 \text{ V}$ ,  $V_{\text{anode}} = 1000 \text{ V}$

Old photocathode



New photocathode

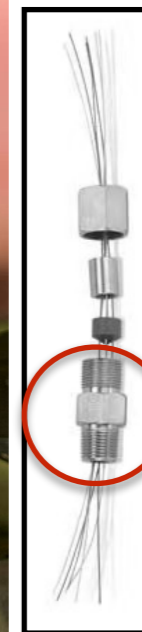


-50, 1000 V	Anode Peak (mV)	Cathode Peak (mV)
Old Photocathode	9.4	17.4
New Photocathode	72.0	130

# LArFCS Construction

## ► PrM Preparation

- Hamamatsu Xenon Lamp PO dispatched, still no lead time
- The fiber feedthrough, ship date 11/24 expected after Thanksgiving
- Fiber quote received, in stock, ordering 15 meters
- Activation gas on order
- Quote for the customized conflat flange with KHV



# LArFCS schedule

## ▶ Plumbing for activation and sampling gas

- Finish the plumbing
- Gas analyzer baseline test with hot getter

## ▶ Gas scrubber activation

- Install the heating and test
- Insulation wrapping
- Start of activation

## ▶ Continued activation of purifier scrubber on LArFCS

- Fiber feethru assembly expected shipping on 11/24

## ▶ PrM test at UCI

- System installation practise
- QC with PrM measurement,
- Operation procedures documentations
- Fiber feethru fabrication at KHV

November

S	M	T	W	T	F	S
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11

# LArFCS schedule

December

S	M	T	W	T	F	S
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

▶ **PrM installation and test**

- PrM and cabling installation
- PrM electronics/readout bench test
- Top flange assembly
- Pump down the system

▶ **Leak check and PrM vacuum test**

- Leak check
- PrM vacuum test with our Xenon light source

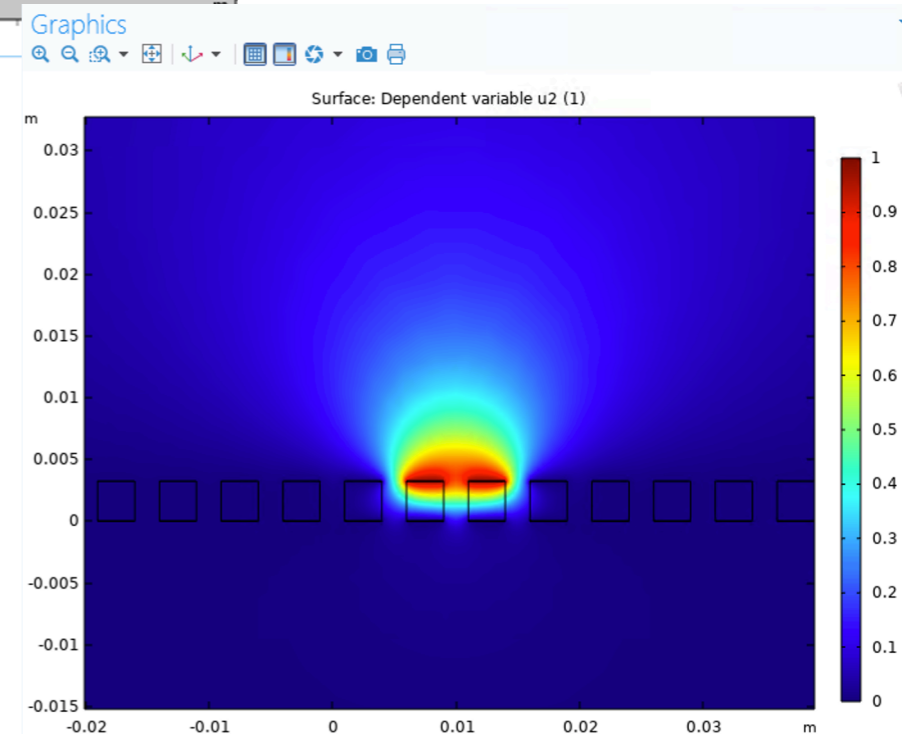
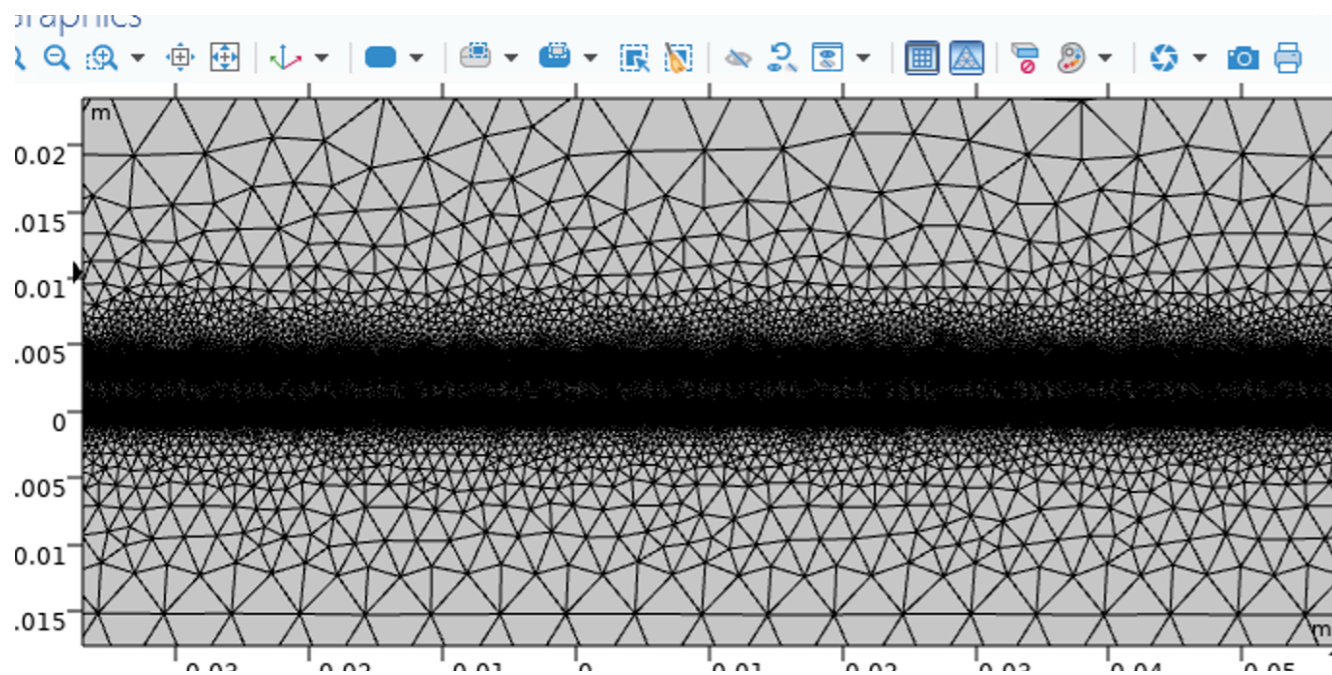
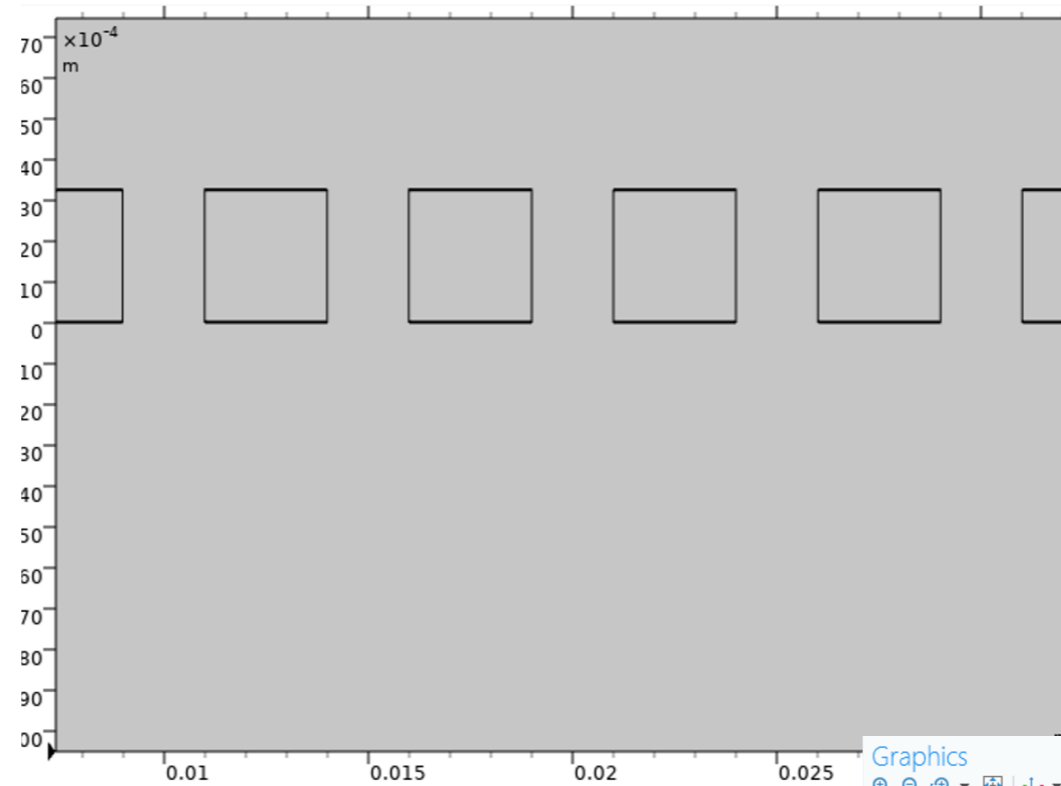
▶ **Trouble shooting and PrM GAr test**

- PrM GAr test
- Contingency in case of additional pump down cycle needed

▶ **PrM Purification demonstration run**

- Cool down and fill with inline filter
- Purity measurement PrM and gas analyzer

# COMSOL Simulation



# COMSOL Simulation

