



SYSTEM TEST @ SLAC

Run 7 Plans

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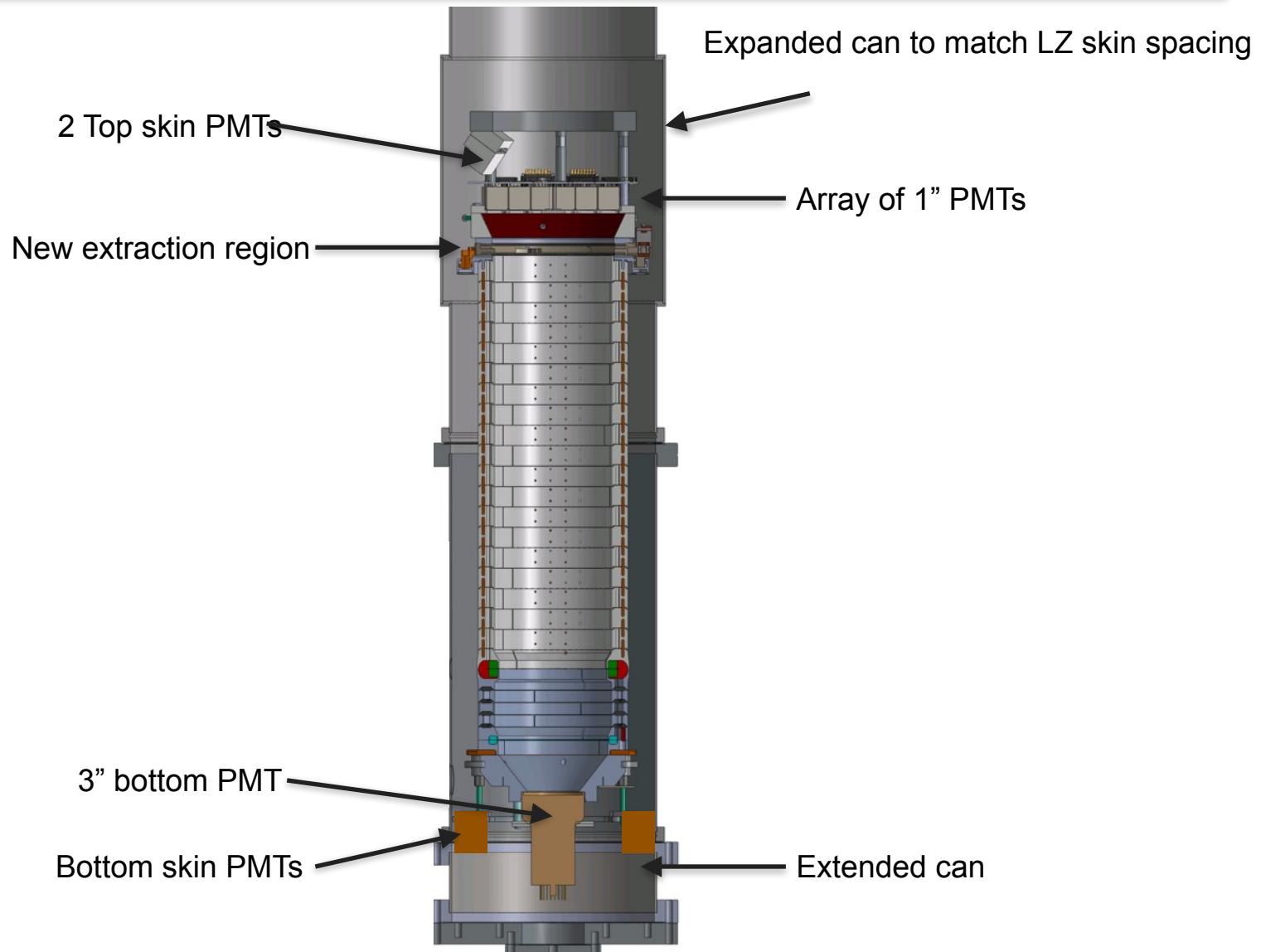
Outline for Run 7

- Hardware changes for run 7
 - Overview
 - Circulation/gas handling
 - Extraction region
- Schedule for Phase I Run 7
- Run 7 test goals
- Test plan for run 7
- Data analysis and run 7
- Personnel for run 7

Essentially first half of Collab mtg talk that would include runs 8+ and phase II



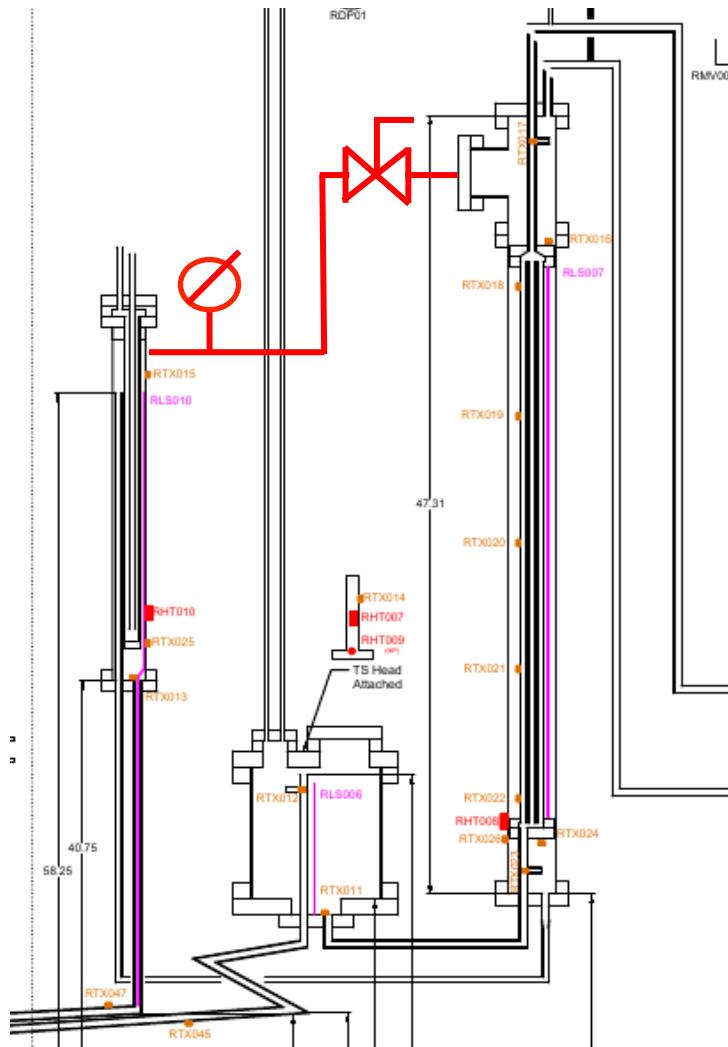
Overview of New Test Parts





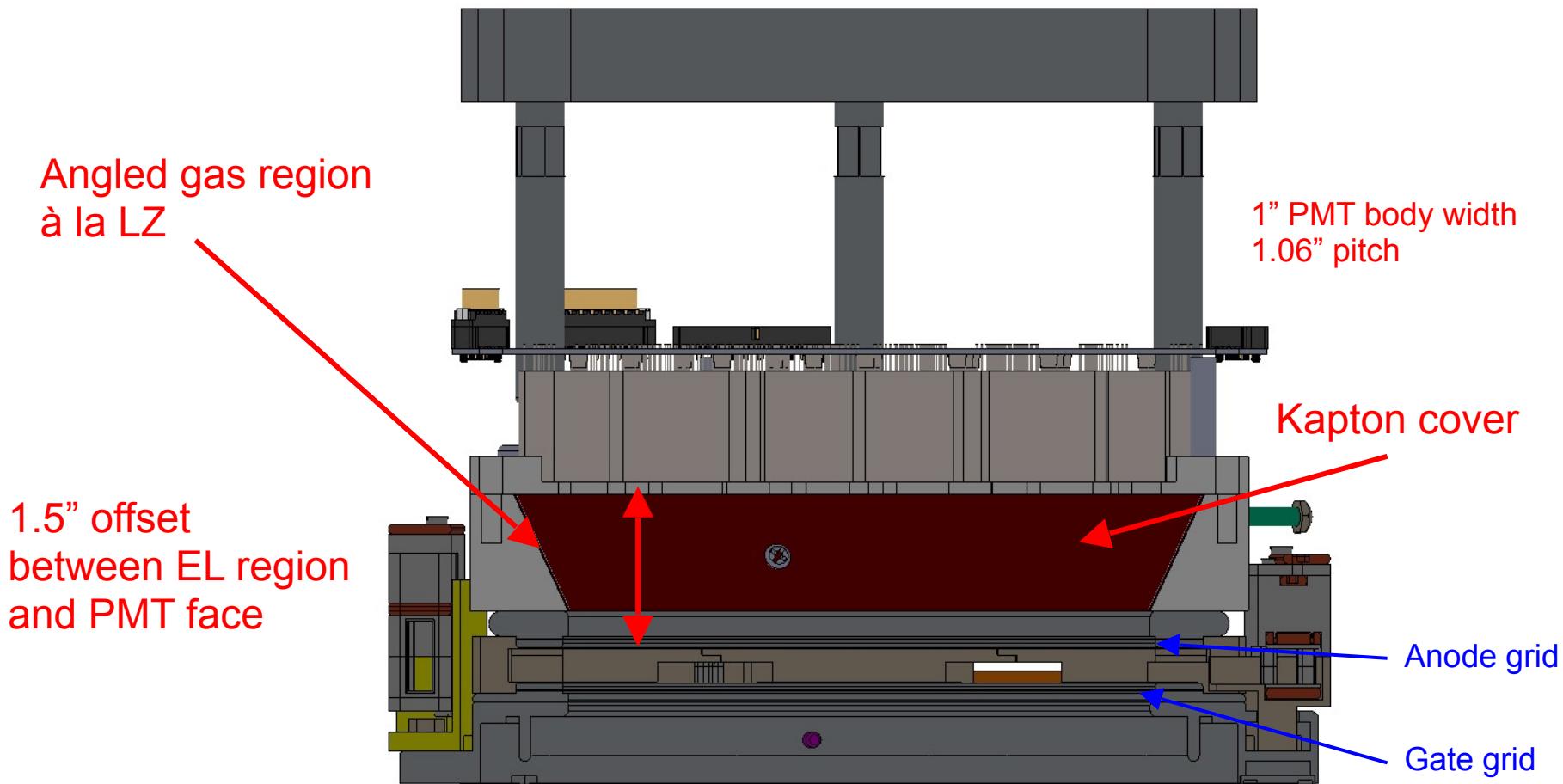
Gas changes

- Gas connection with valve and pressure transducer between sub cooler and 2PHX
 - Top WBS1.4 request
 - Diagnose or solve surface oscillations
- Calibration source injection (starting with thoron)
- Additional temperature sensors
- Pump maintenance





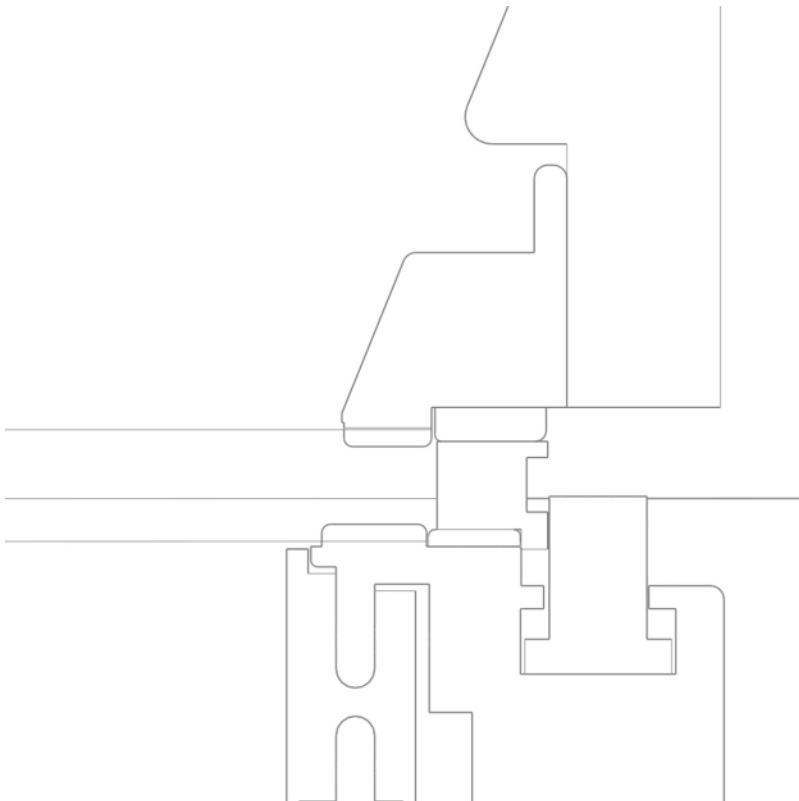
Top PMT Array



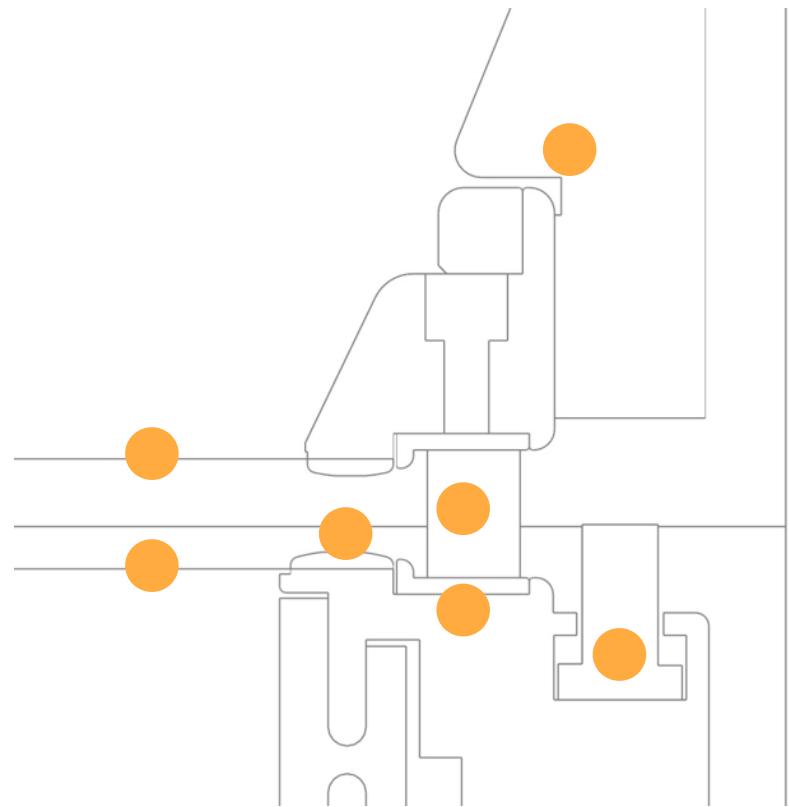


Extraction Region Differences

OLD



NEW



+ new Level Sensors



Run 7 Schedule

Will have gantt from smart chart

[https://app.smartsheet.com/b/publish?
EQBCT=23c1a4e212dc4b0eb3e30a31b
3d3a9f9](https://app.smartsheet.com/b/publish?EQBCT=23c1a4e212dc4b0eb3e30a31b3d3a9f9)



Run 7 Test Goals

- Primary Goal
 - Eliminate or diagnose the cause of a large rate of single photons previously seen when the extraction region was biased to LZ requirement voltages.
- Secondary Goals
 - Extraction Region: study of single electrons and verification of an acceptable rate of electron emission from the gate grid
 - Extraction Region: Longevity studies of the extraction region at voltage
 - Cathode: operate at LZ goal fields
- (Goals from previous Goals and scope document <https://docs.google.com/document/d/166-h-cloyQkAkOgK9EkPBgR0T5g-LIxM79z7wzZDJos/edit>)



Run 7 Test Plan

- Rates in Ar, Xe gas before turning on
- S1 rate no field, no circulation
- S1 rate no field, circulation
- Gate and anode to requirement voltages (+/-5.75 kV)
- Gate and anode at requirement voltage with increased purity (3+ days of circulation)
- Thoron source injection
- External Cs source
- If gate/anode successful:
 - Gate and Anode at requirement voltage for longevity (1 week)
 - Gate and Anode to goal +/-7 kV
 - Cathode from requirement towards goal fields
 - Circulation tests as function of flow
- If gate/anode unsuccessful:
 - Explore Gate and Anode voltages and tripping



Run 7 Analysis

- Using LZap
 - Pulse finding
 - Pulse classification
 - Event building (S1+S2)
- Some complications
 - System test is untriggered
- Rates of varying pulse classes vs changed conditions
- With Thoron source hope to have energy and purity measurements



Run 7 Personnel

- SLAC

- Alden, lead
- Eli, tech/student
- Kelly, Ryan grad students
- Maria Elena, electronics
- Tomasz, TJ, analysis
- Tom, Steffen, primary support
- Dan A., Wei, Christina, Shaun, secondary support
- Rachel, new UW postdoc, May 1 start
- Summer students/rotation students

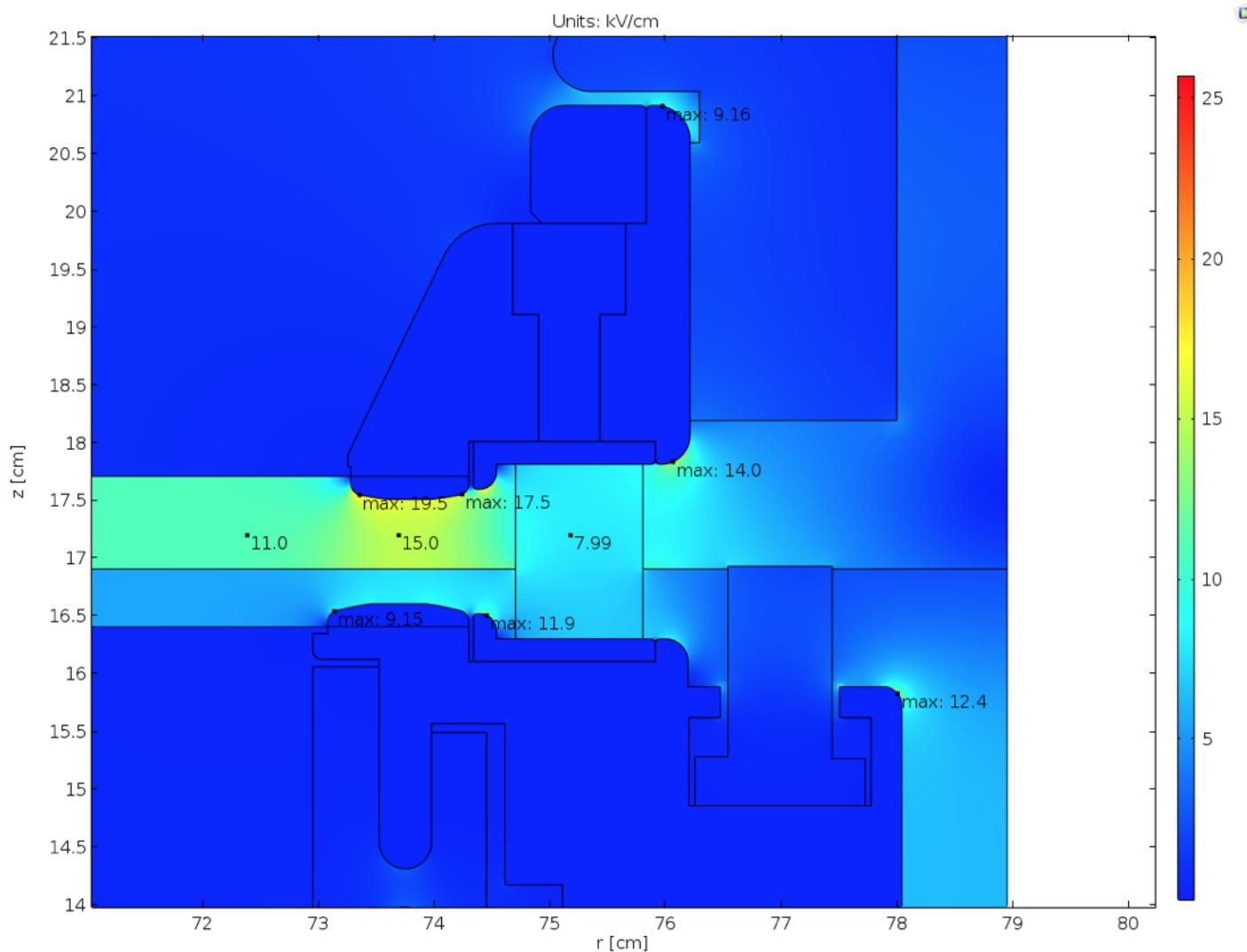
- Visitors

- Jonathan UW grad student(mid-May- mid-Aug)
- Dylan Northwestern grad student(mid-June-mid-Aug?) TBD
- Wolfgang + student (July start)
- In discussion: UMass student, Oxford students

Backup Slides



New (LZ) Field Sim





New Level sensor Field Sim

