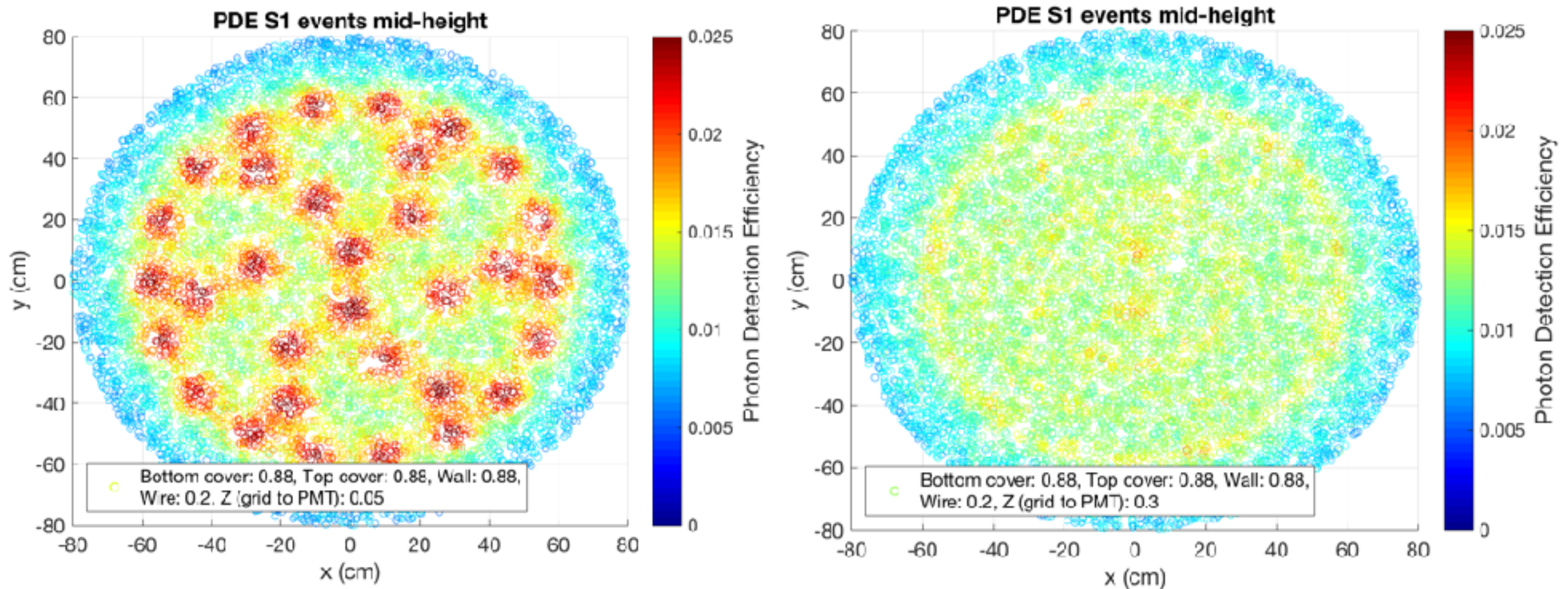


Summer 2017 work

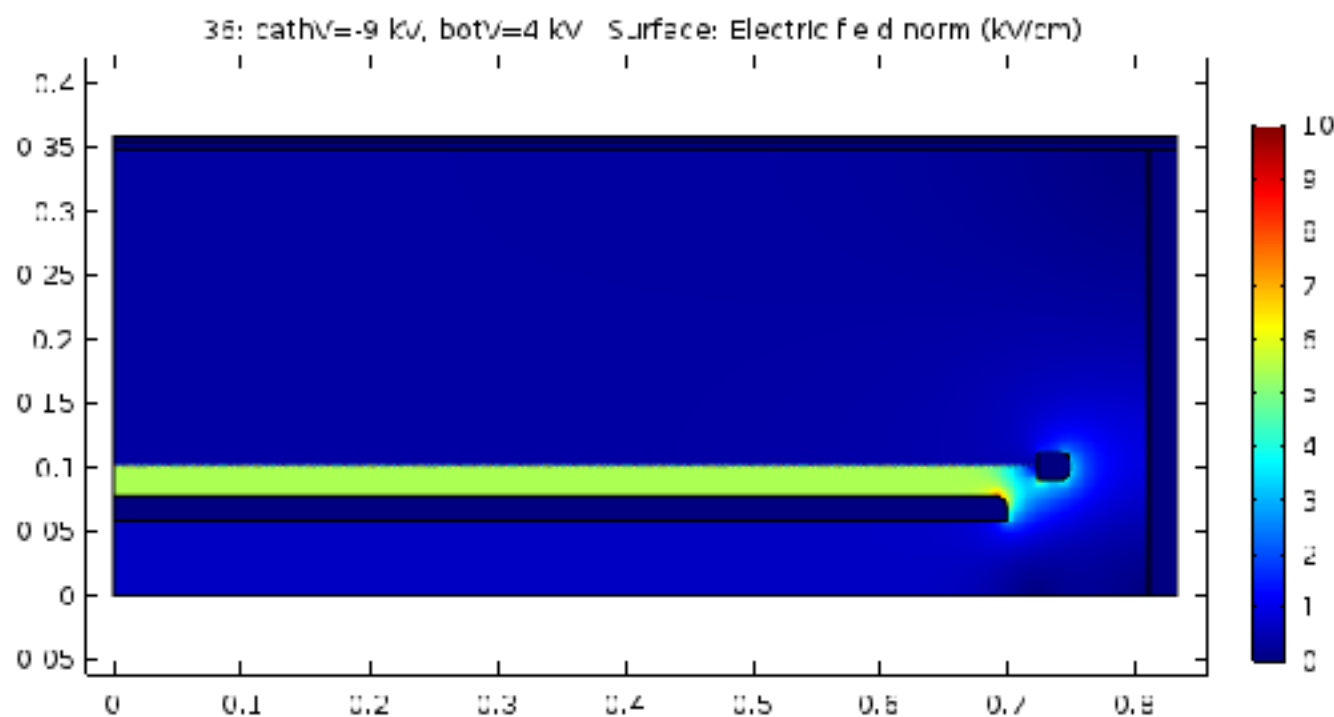
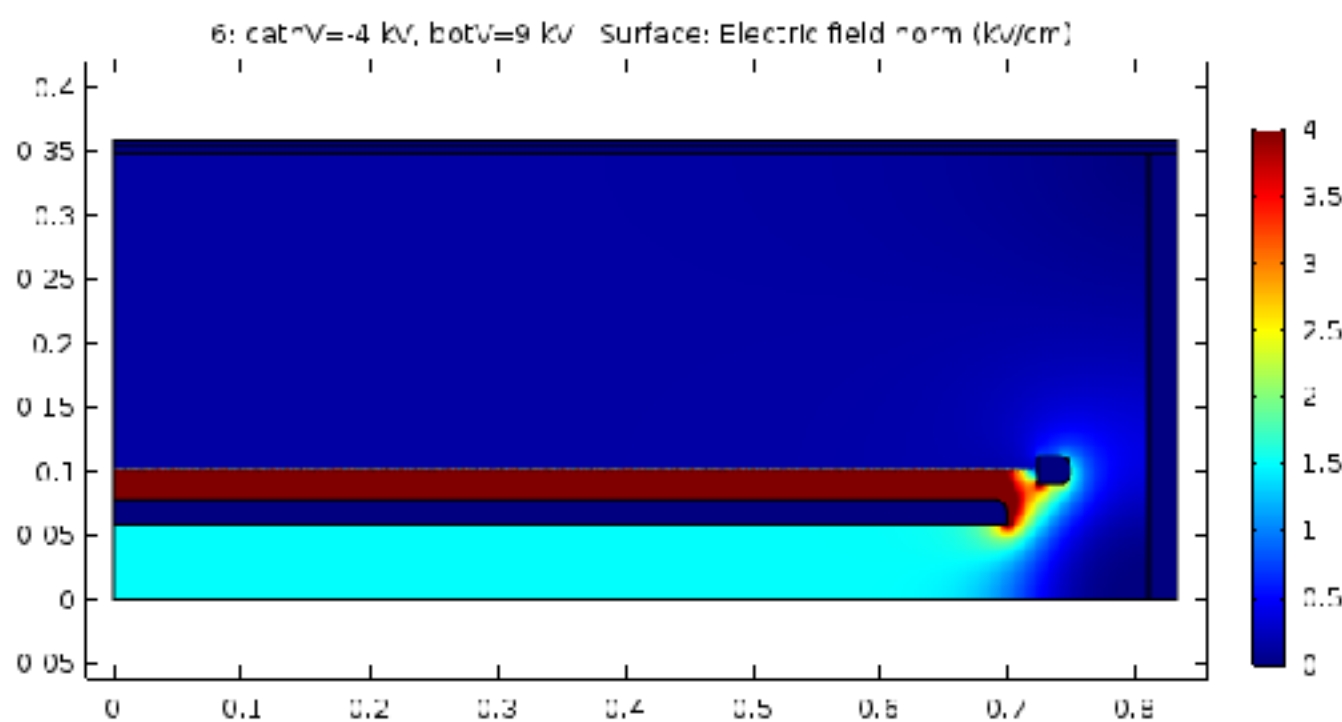
Rachel Mannino
13 September 2017

Phase II optical simulations



- Phase II is a system test vessel for LZ designed to test the grids' performance at their baseline and goal voltages and fields.
- Optical simulations needed to determine distances between PMTs and the grids where light will be emitted. Detector surfaces are covered with reflective AlMgF2 coating.
 - *(left)* Distance between the grid and the PMTs is 5 cm which is too close!
 - *(right)* Distance between the grid and the PMTs is 30 cm. This gives a nice uniform response for our 32 PMTs.

Phase II electrical simulations



- Did electrical simulations for the different configurations to be tested in Phase II.
- Determined some of the positions of the grids, shape of the other electrodes.
- Determine what range of voltages is necessary to achieve electric fields we want to test.

Analysis work

- LZ Mock Data Challenge 1 (MDC1)
 - Single photon size = studying the size of single photoelectrons from the simulated data. Real PMTs usually have 1 phe/photon, but ~20% of the time, 2 phe/photon is emitted.
- LUX
 - Bad area cut = analysis cut to remove events with large amounts of “bad area.” These are events with abnormal amounts of light or electron trains, etc.