PHASE II & BAD AREA CUT UPDATE

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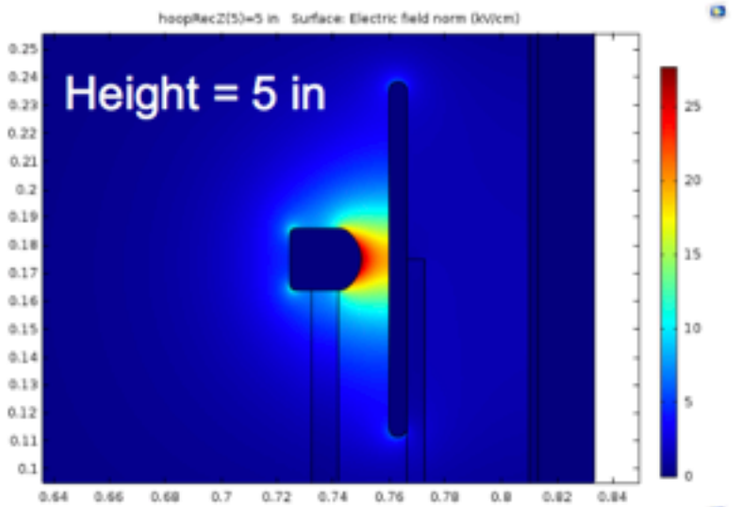
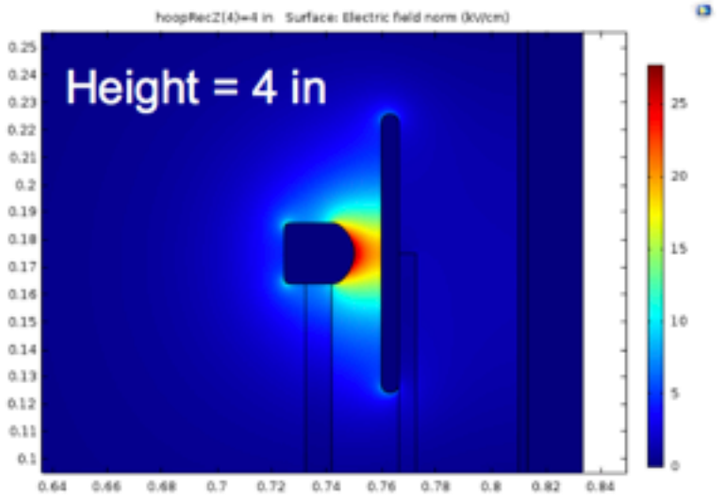
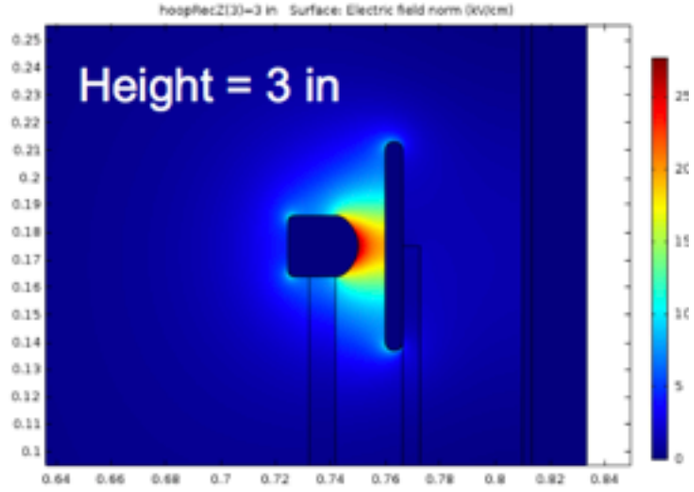
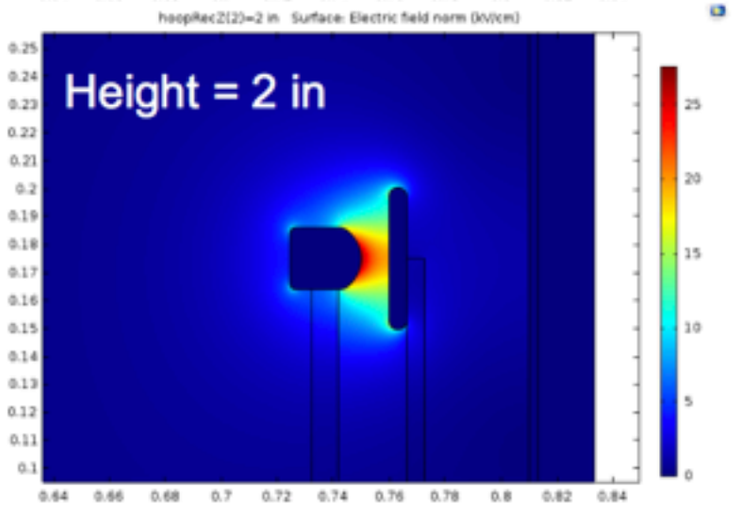
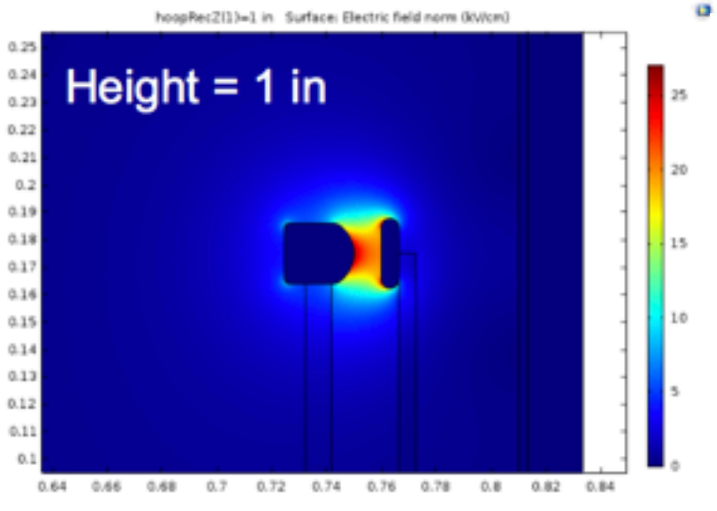
PHASE II: FINALIZING DIMENSIONS OF SUPPORTS

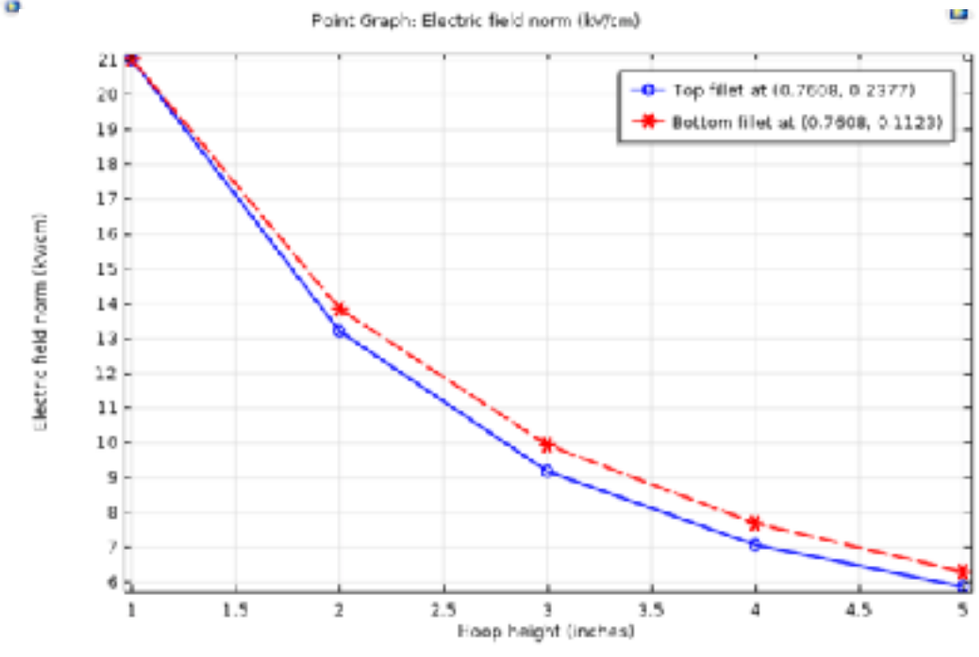








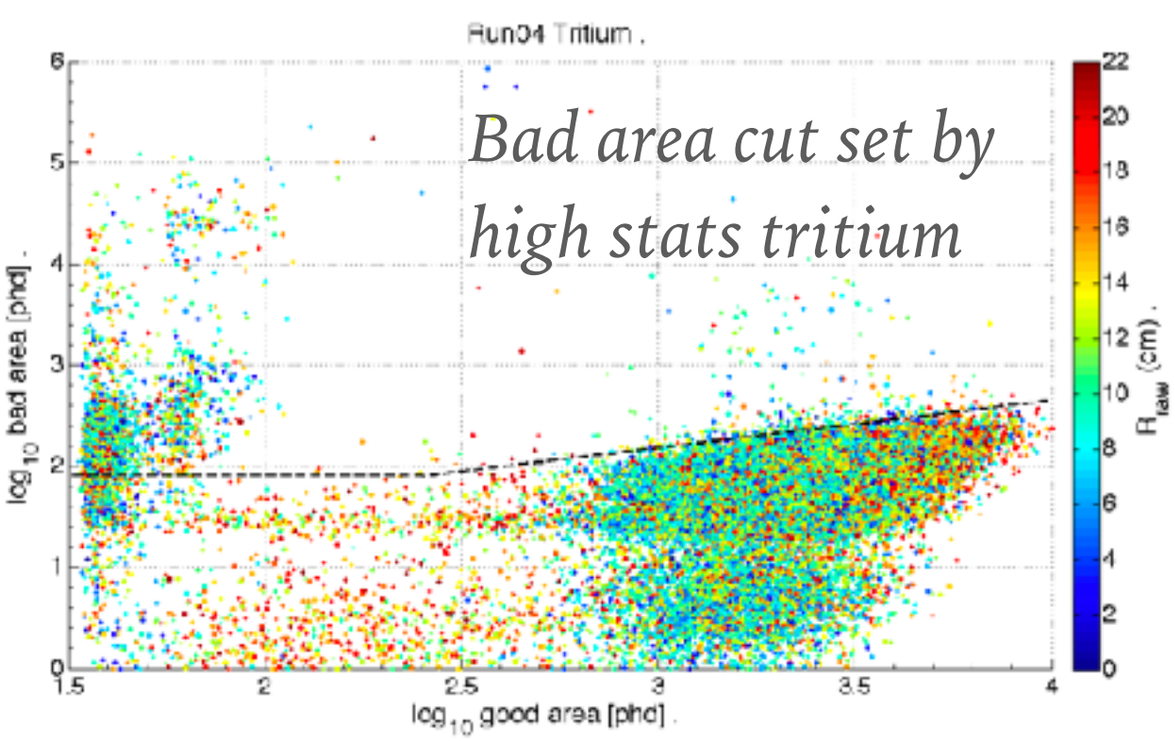


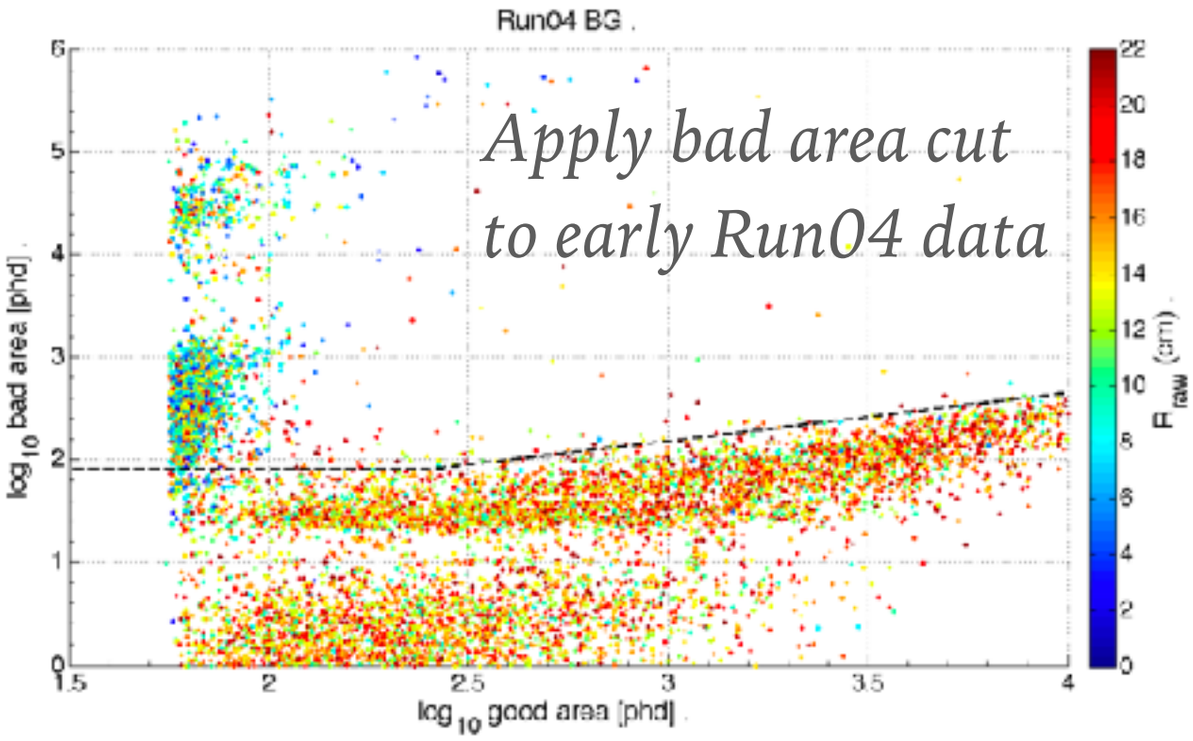


- Cathode ring to field hoop = 1 cm
- Generally, run with ~6 kV on the field hoop and -16 kV on the cathode
- Field hoop is 1/4” thick Al with filleted corners of r=1/8”
- Selecting a field hoop height of 3-5” gives lower fields on the fillets

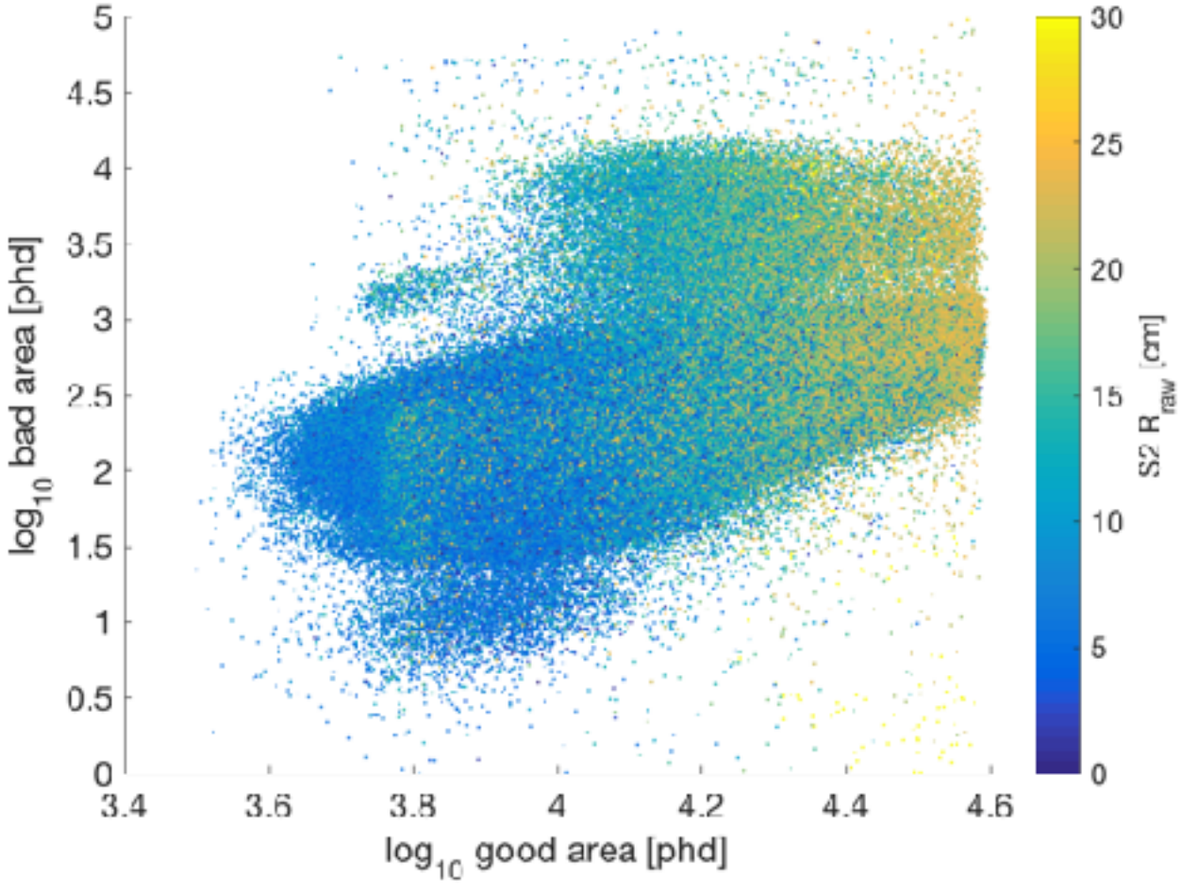
LUX RUN04 BAD AREA CUT

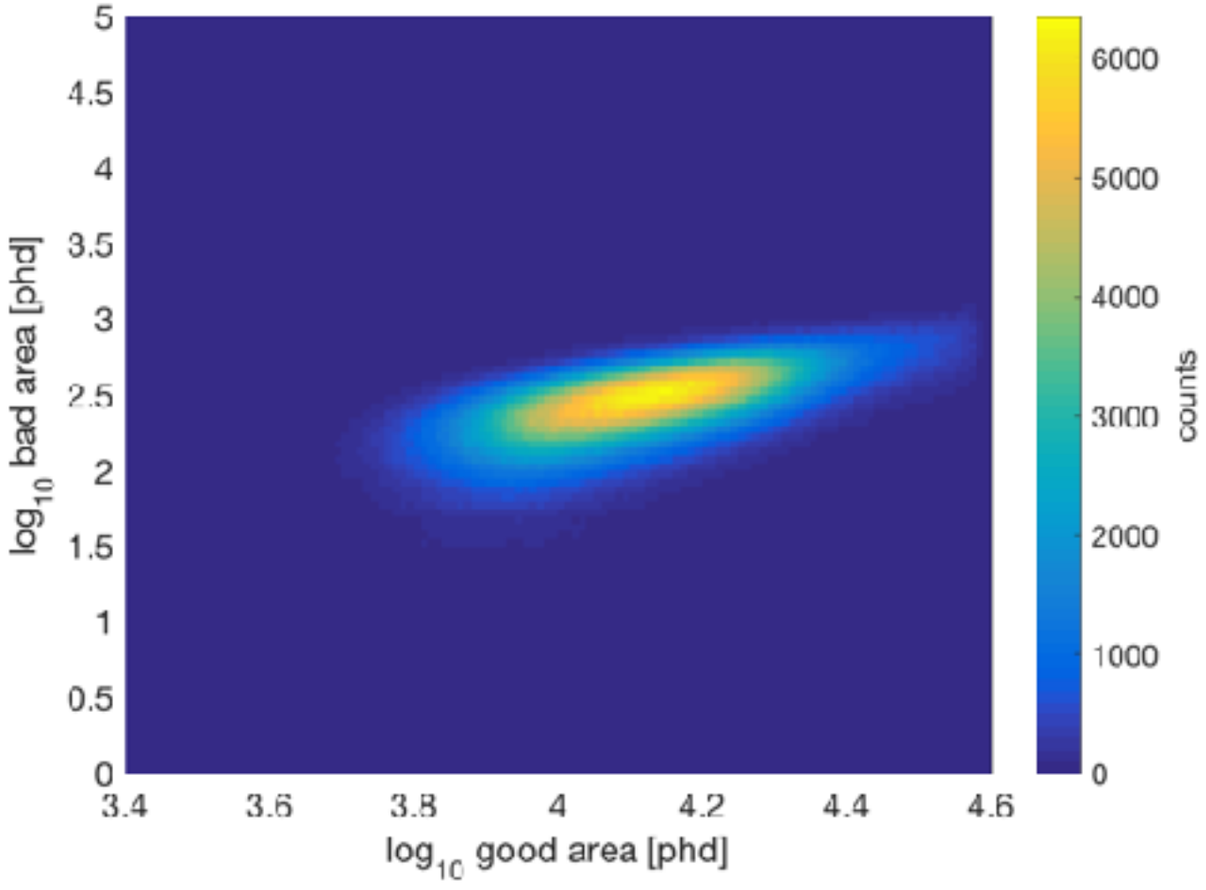
- LUX experiment uses a “bad area cut” to exclude events with large amounts of extra signal (excess single photoelectrons, electron trains, etc.) in the event window
  - Quick way to remove anomalous single-scatter events
- Good area = S1 area + S2 area;
- Bad area = Full event area - Good area;
- Created a bad area cut with early Run04 data using tritium calibration data
- Now: extend the bad area cut to higher energies (higher areas) by using 83m Kr calibration data



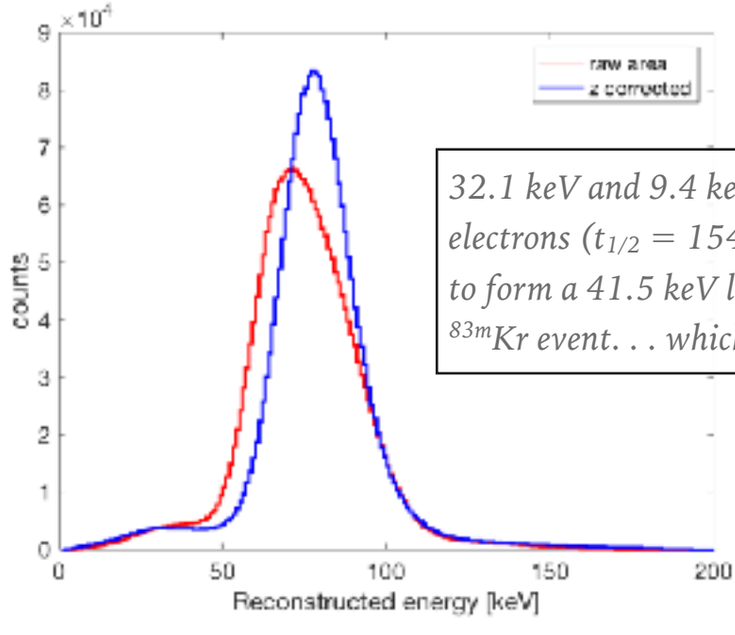


LUX RUN04 BAD AREA CUT: USE ^{83M}KR





- Plotting log10(bad area) vs. log10(good area) in a scatter plot (*left*) and density plot (*right*).
- Bad area cut will be set to keep the main population of ^{83m}Kr.
  - Keep ~99% events in bins of log10(good area).
  - Need to check these populations' energies, etc.



32.1 keV and 9.4 keV conversion electrons ($t_{1/2}$ = 154 ns) merge to form a 41.5 keV line in an ^{83m}Kr event. . . which is shifted.