dRICH simulation meeting

dRICH envelope definition

```
DRICH_aerogel_material          = "Aerogel_DRICH" = Aerogel_DRICH
DRICH_aerogel_thickness         =           4.000 = 4.0*cm
DRICH_aerogel_zpos              =         197.300 = 197.300000
DRICH_airgap_material           = "AirOptical" = AirOptical
DRICH_airgap_thickness          =           0.001 = 0.01*mm
DRICH_airgap_zpos               =         199.300 = 199.300500
DRICH_bore_slope                =           0.057 = (DRICH_rmin1 - DRICH_rmin0) / DRICH_length
```

```
DRICH_sensor_sph_radius         =         110.000 = 110.000000
DRICH_sensor_thickness          =           0.010 = 0.1*mm
DRICH_sensorbox_length          =          10.000 = 10.0*cm
DRICH_sensorbox_rmax            =         185.000 = DRICH_rmax2
DRICH_sensorbox_rmin            =         106.656 = DRICH_rmax1 + 2*cm
DRICH_snout_length              =          20.000 = 20.0*cm
DRICH_wall_thickness            =           1.000 = 1.0*cm
DRICH_window_thickness          =           0.300 = 0.3*cm
DRICH_zmax                      =         315.000 = DRICH_zmin + DRICH_length
DRICH_zmin                      =         195.000 = ForwardRICHRegion_zmin
```

Numbers for PDU

```
DRICH_pdu_gap              =       0.300 = 3.0*mm
DRICH_pdu_num_sensors      =       2.000 = 2
DRICH_pdu_sensor_gap       =       0.020 = 0.2*mm
DRICH_pixel_gap            =       0.020 = 0.2*mm
DRICH_pixel_pitch          =       0.320 = DRICH_pixel_size + DRICH_pixel_gap
DRICH_pixel_size           =       0.300 = 3.0*mm
```

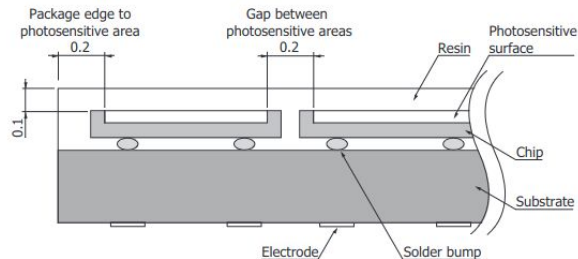```
DRICH_sensor_resin_size   =   2.580 = 25.8*mm
DRICH_sensor_resin_thickness =   0.135 = 1.35*mm
DRICH_sensor_size   =   2.560 = DRICH_sensor_resin_size - DRICH_pixel_gap
```

Discussion with Roberto. 1.35 mm maybe too much!



MPPC (Multi-Pixel Photon Counter) arrays | S13361-3050 series

Cross section detail (unit: mm)

# Thickness and refractive index optimization

Next week I plan to perform studies for simulating aerogel with different thicknesses. Relatively fast and easy.
My plans : current 4 cm increased by 2 cm in steps of 0.5cm!
Would be nice to receive some other parameters for the aerogel (r.i., abs length, rayleigh) for different materials.

This will allow us to have a performance figures for different aerogels of different thicknesses.

# Tracking contribution

Preliminary studies yet to be done. For instance allowing us some smearing and print the results out.

We see some effects of interactions of pions upstream and generating electrons. Adding and rejecting the AC-LGAD and its effect can be studied relatively faster. End of November should be a good estimate to have some preliminary understanding.
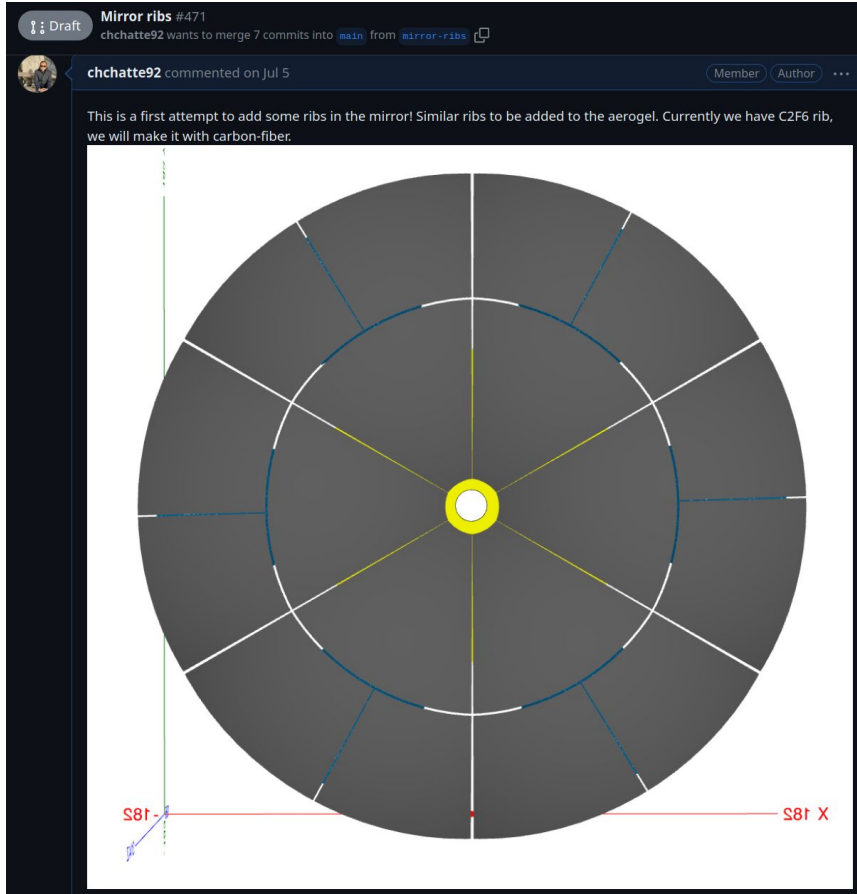
# Background study

Contacted Roberto.
First study will be to check SPE resolution (both Aerogel and gas rings) and Signal over noise ratio
Keeping 1 ns window and injecting 0, 1.e3, 2.e3, 5.e3, 10.e3, 20.e3, 50.e3, 100.e3, 200.e3, 500.e3 hz rates.

Part of Tiziano's thesis. Will be done over the next weeks.

# Mirror segments and coating



Currently hardcoded!
A placeholder coating will be added on top of it.
Discussion with Chris today

# multi-particle events;

Open discussion.

# usage of ePIC simulation campaign outputs.

Open discussion!

Significant statistics! Analyze those data.
Application:

**Library of events :  a list of hits, information of particle**

Easy way out!
User that makes some preliminary analysis…