Cylindrical μRWELL Detector Prototype Development

ePIC MPGD-DSC Workfest
Florida Institute of Technology
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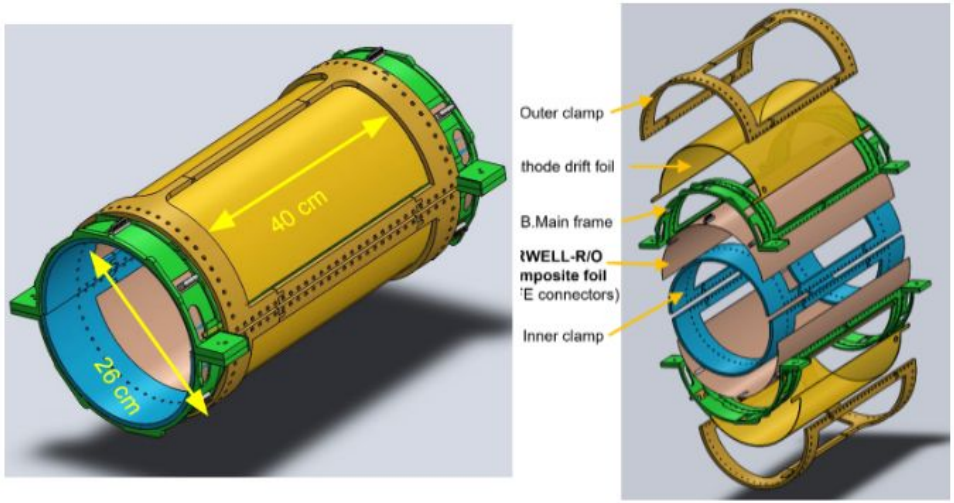
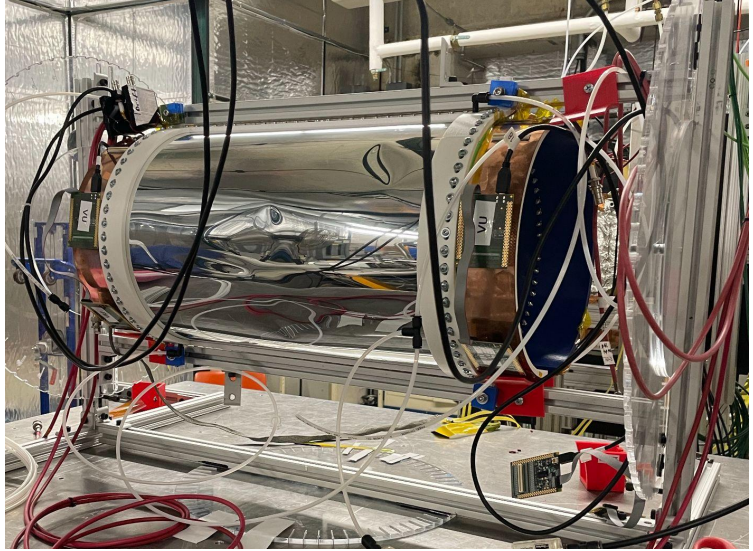
Cylindrical µRWELL Introduction

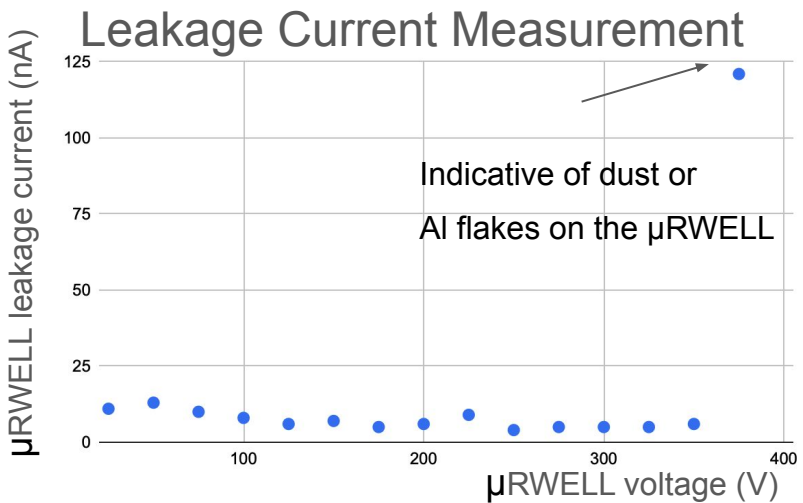




- Drift foil (Al-mylar) had developed dents during tests at FNAI

HV and gas leakage testing

- In a test assembly with drift foil & mock µRWELL foil,
  - pressure drops from 20 mbar to 10 mbar in one hour
  - the drift shows low leakage current up to 1000V
- In an assembly with drift foil & real µRWELL foil,
  - pressure drops from 20 mbar to 10 mbar in two min.
  - µRWELL has small leakage current up to 375V
  - above 350V, sudden current increase observed
  - This HV test was with ½ Honeycomb cylinder



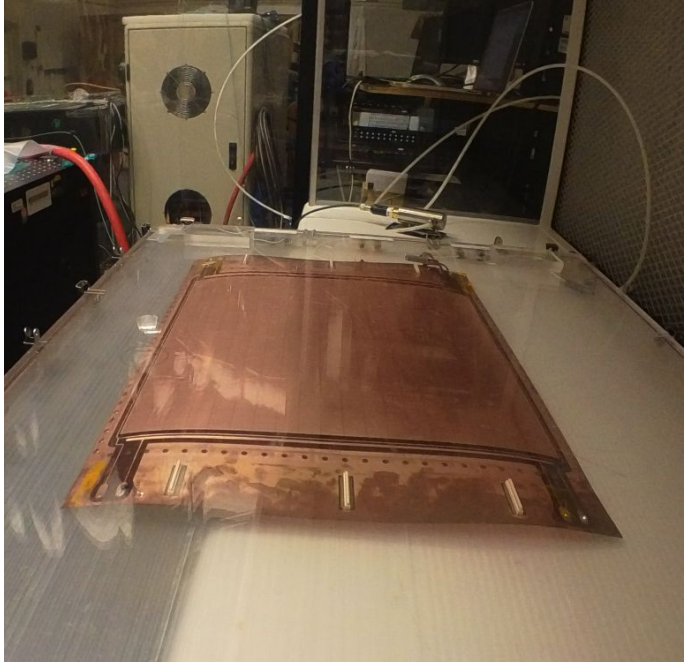
μRWELL Foil cleaning

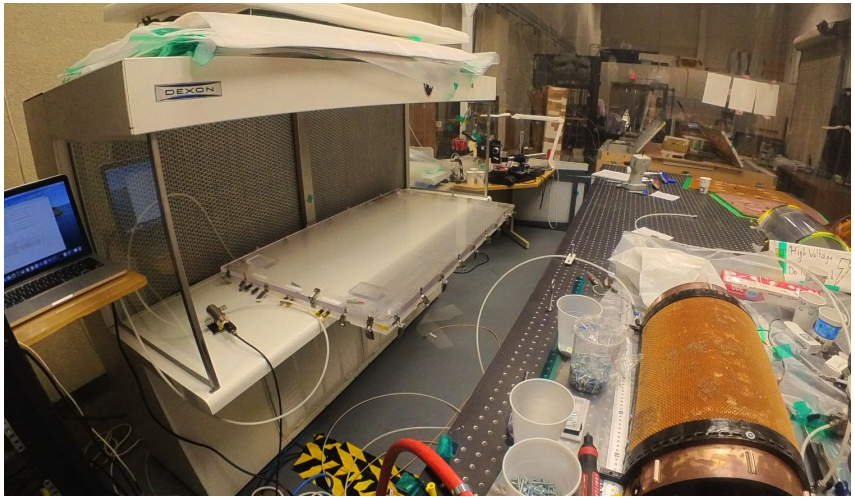
Foil Inspection Testing (Acrylic box)

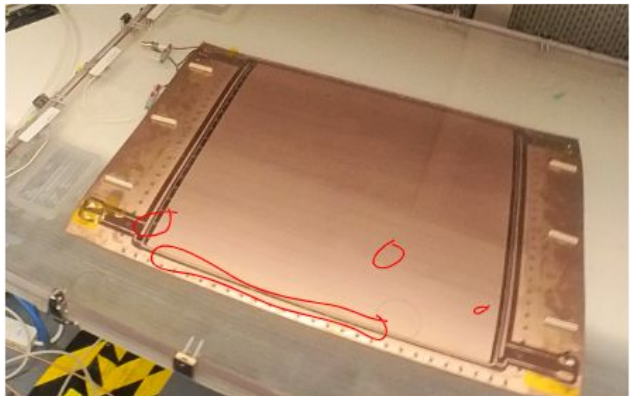
- Heat discoloration side - 2-3 dark spot/red spot/ hole spot

Process for Cleaning

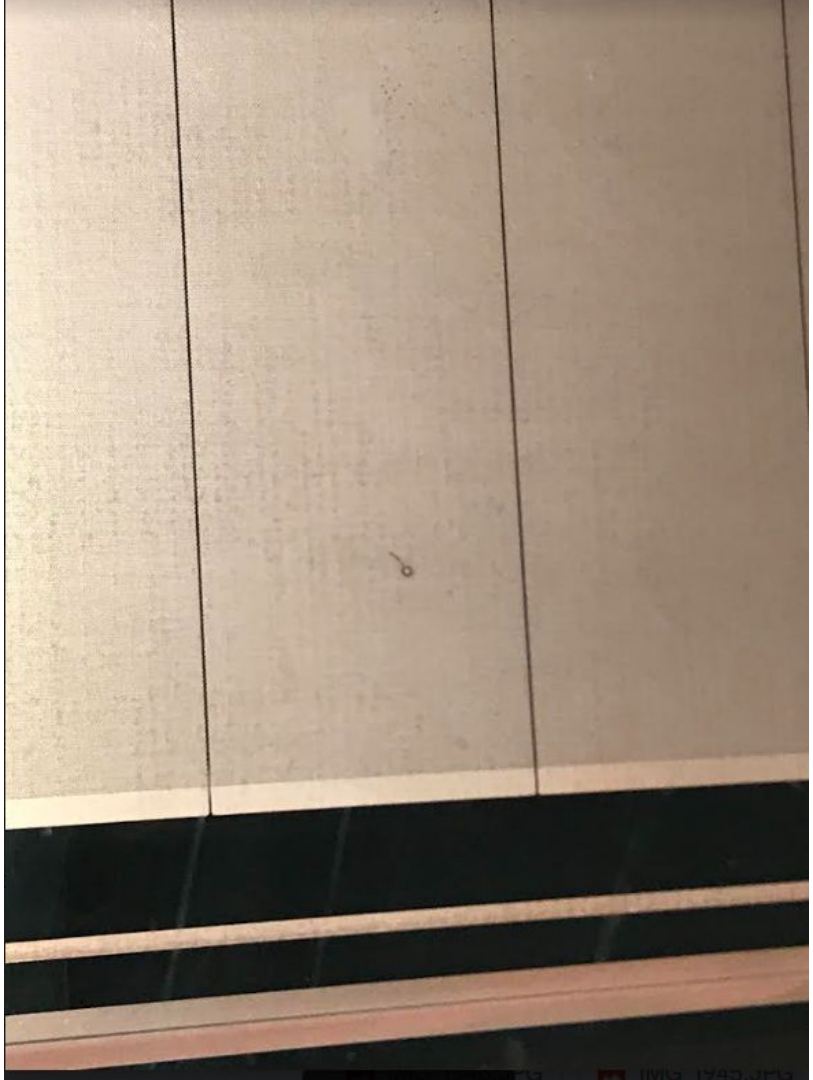
- Vacuum cleaning box, rollering box, rollering foil, 3 different rollers
- Nitrogen Flushing to acrylic box
- Dust counts with Kanomax : in counts/m^3 for .3um,.5um,5um)



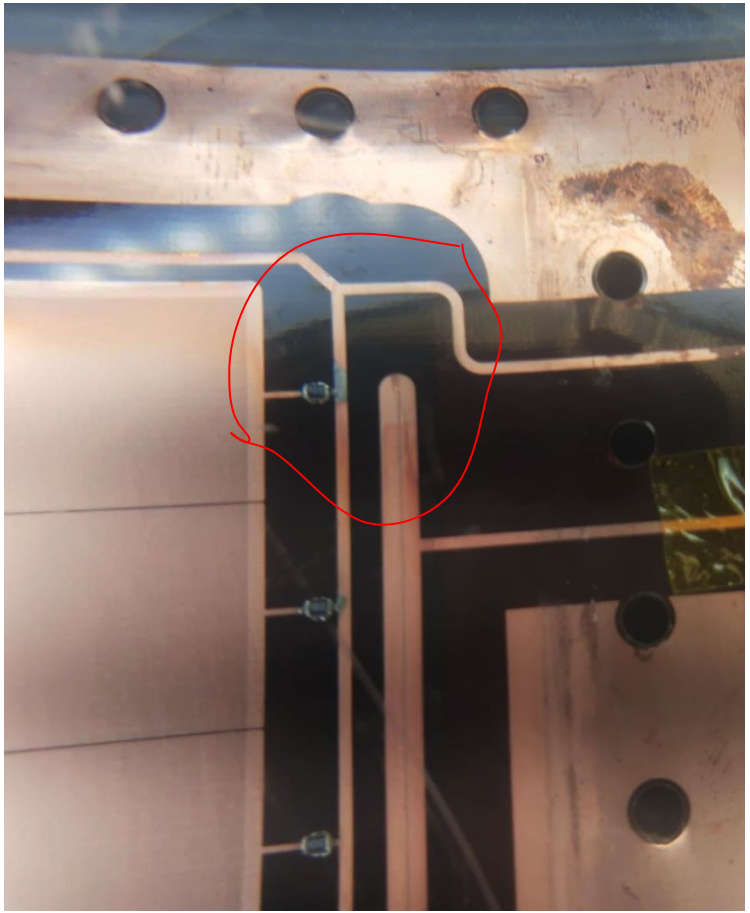


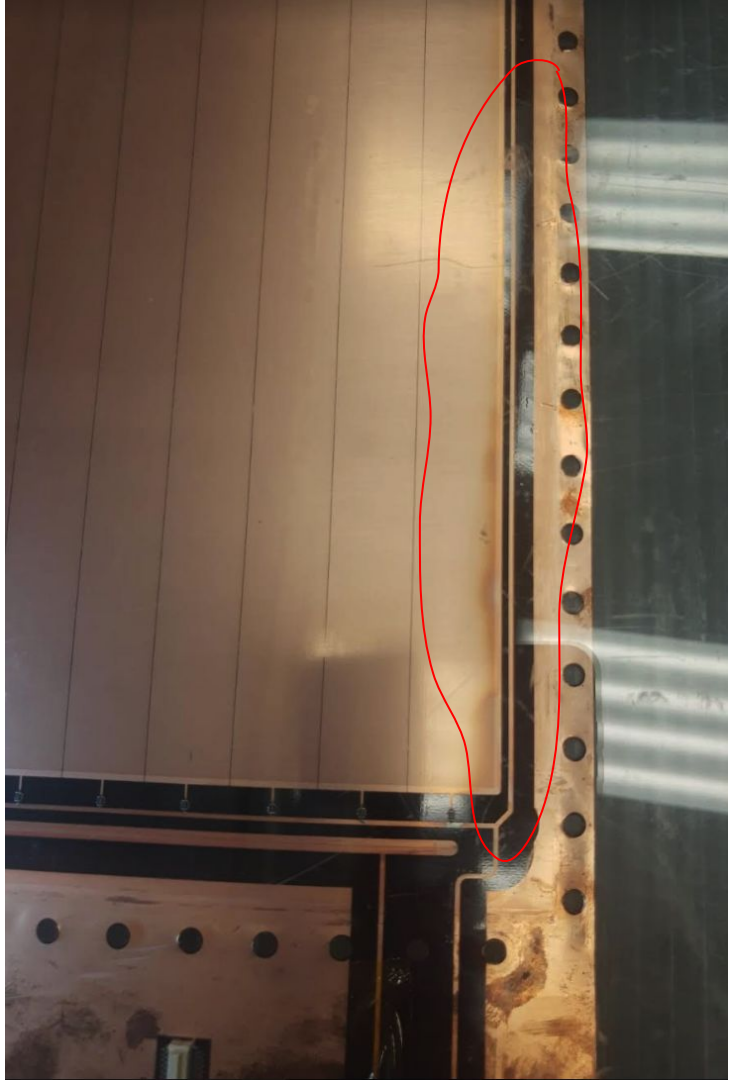


uRWELL foil “spots”



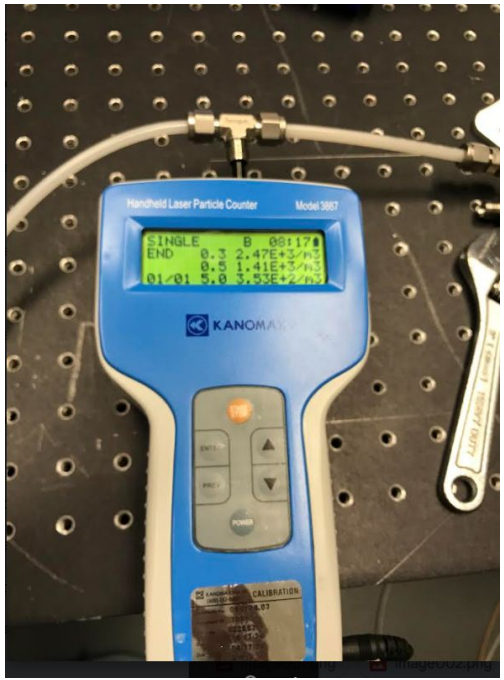
uRWELL foil imperfections





Gas line schematic and particle counts

Nitrogen Gas Tank Regulator — 5um Dust filter — Flow Meter — 5um Dust filter — Acrylic Box



- Tested Nitrogen Line at various points with particle counter
- Added two dust filters to see if results improved
- Will Repeat Measurements with Co2

Kanomax location	Dust Counts/m^3 (.3um, .5um, 5um)
After regulator	(1.96E, 6.06E4, 3.7E3)
After flow meter	(1.51E3, 7.06E2, 1.59E3)
Before acrylic box	(2.47E3, 1.71E3, 3.53E2)
After acrylic box	(2.48E3, 1.41E3, 1.77E2)

Discussion…