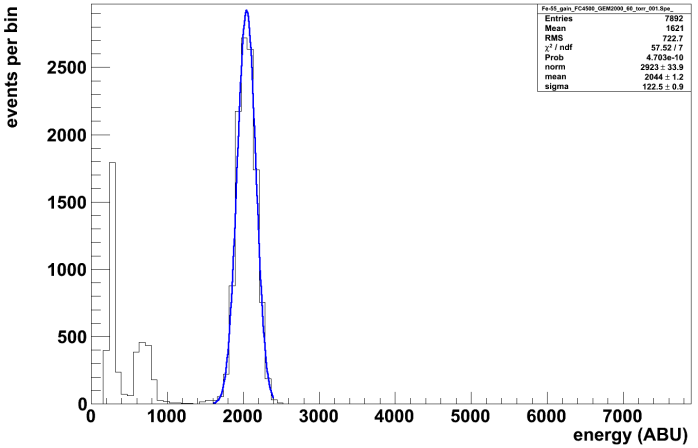
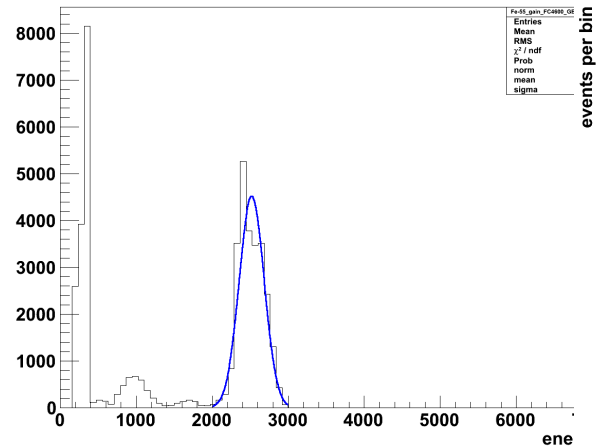
Triple GEM Gain Study SF_6 (It's Noise)

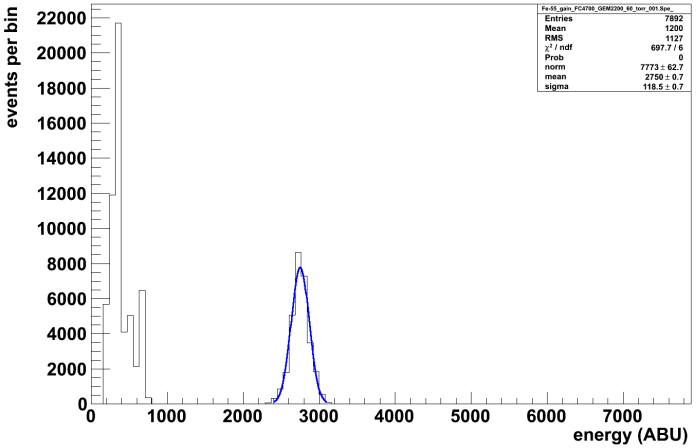
FC = 4500V; GEM = 2000V



FC = 4600V; GEM = 2100V

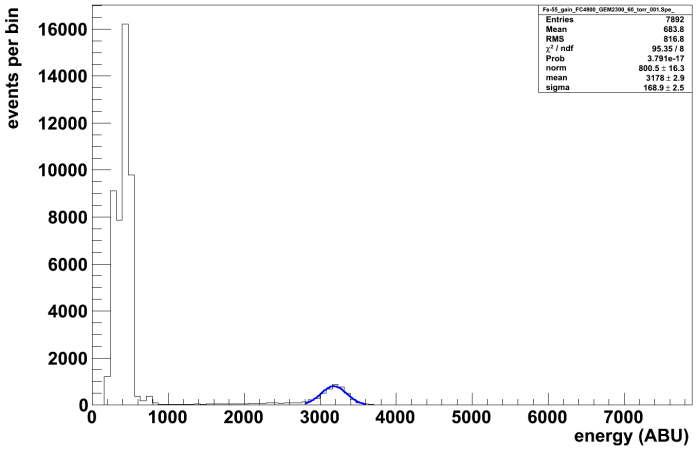


FC = 4700V; GEM = 2200V

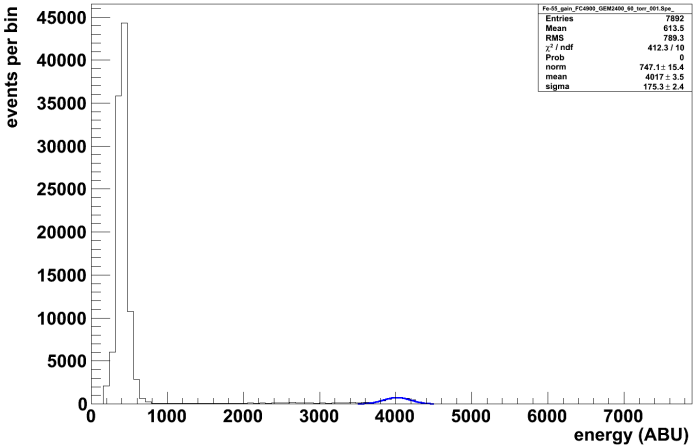


Time

FC = 4800V; GEM = 2300V



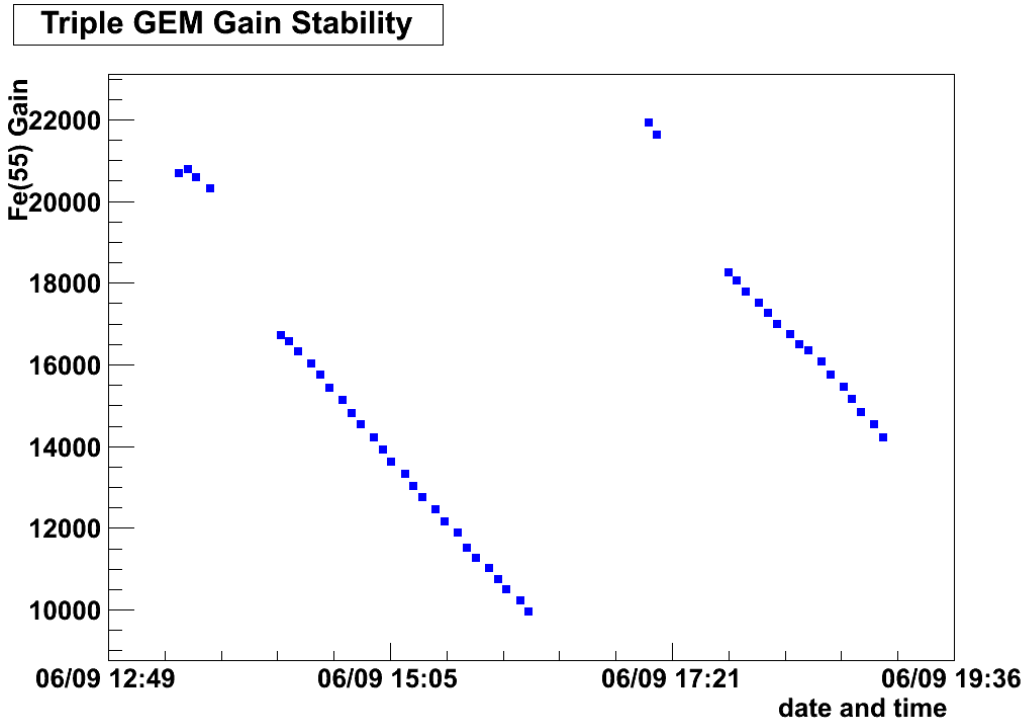
FC = 4900V; GEM = 2400V

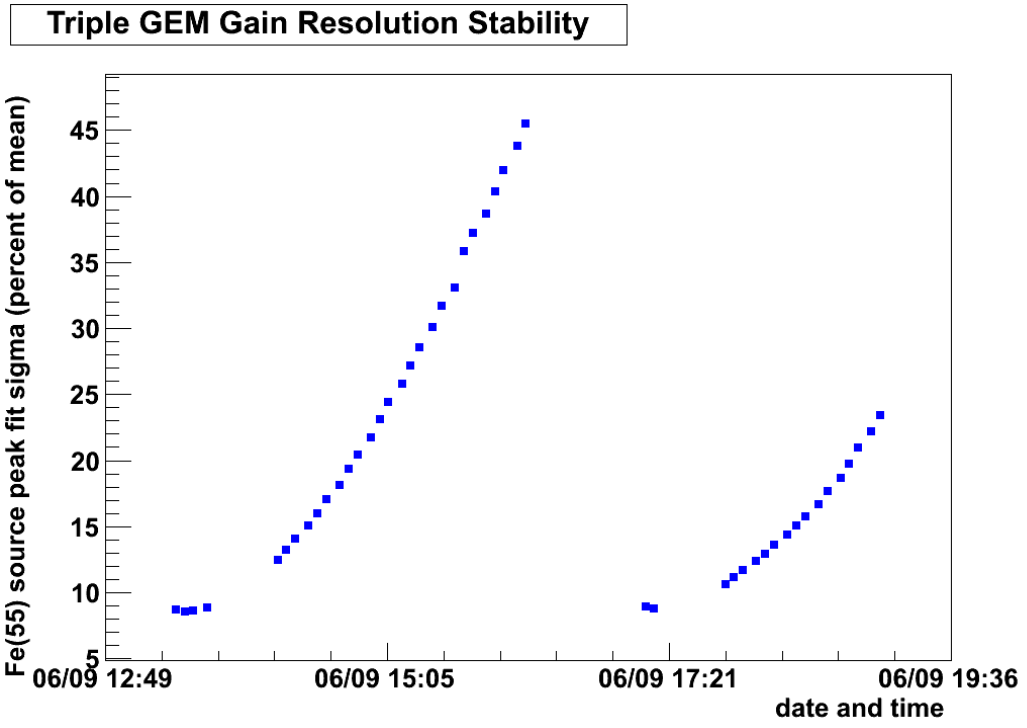


Time

SF_6 Contamination?

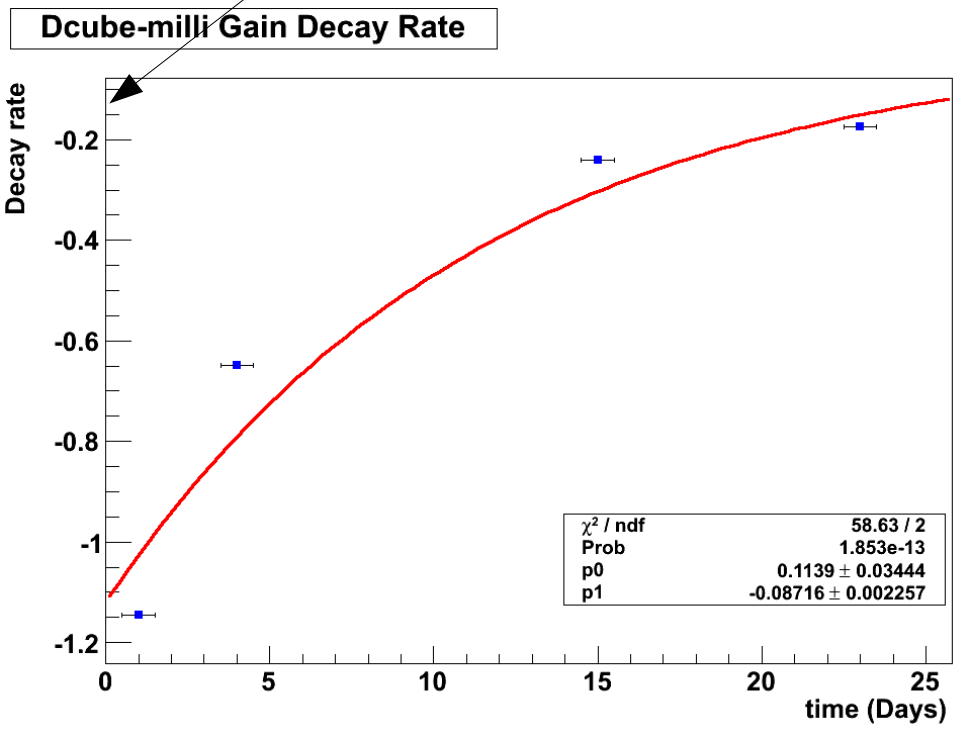
- $HeCO_2$ w/ different preamp ~3x lower gain
- Pumped down overnight to ~10^{-4} torr
  - Gain decayed very quickly (10% per hour vs 10% per day before)
- Purged w/ N_2 and $HeCO_2$ twice and gain still decayed w/ gas flow
- Have never seen gain decay like this

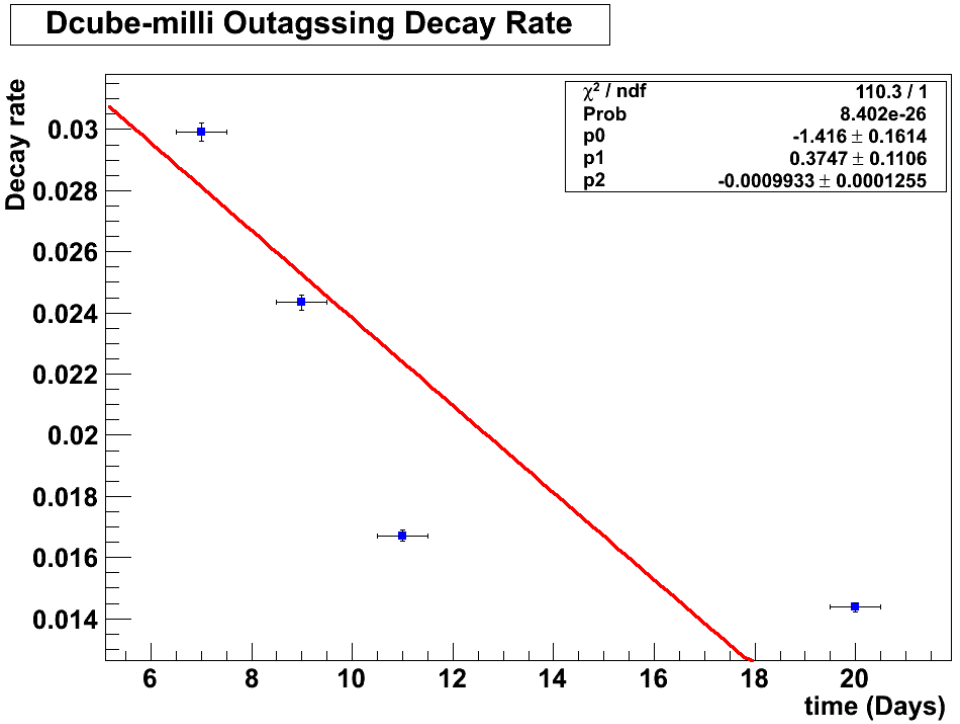




D^3 - milli Gain Decay & Outgassing

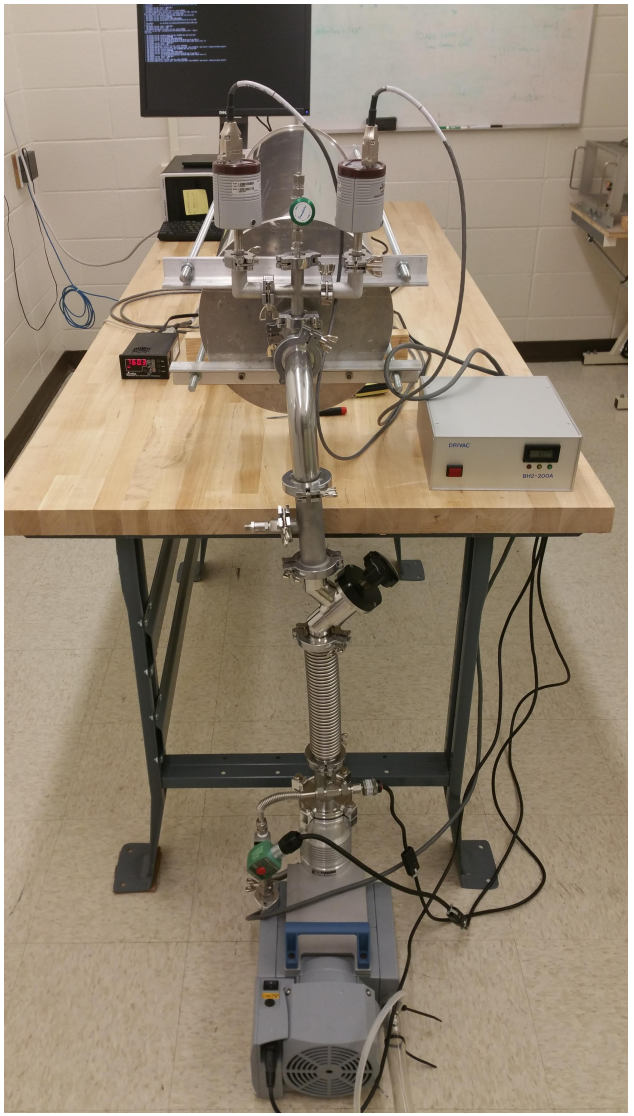
Zero on this axis is no gain decay

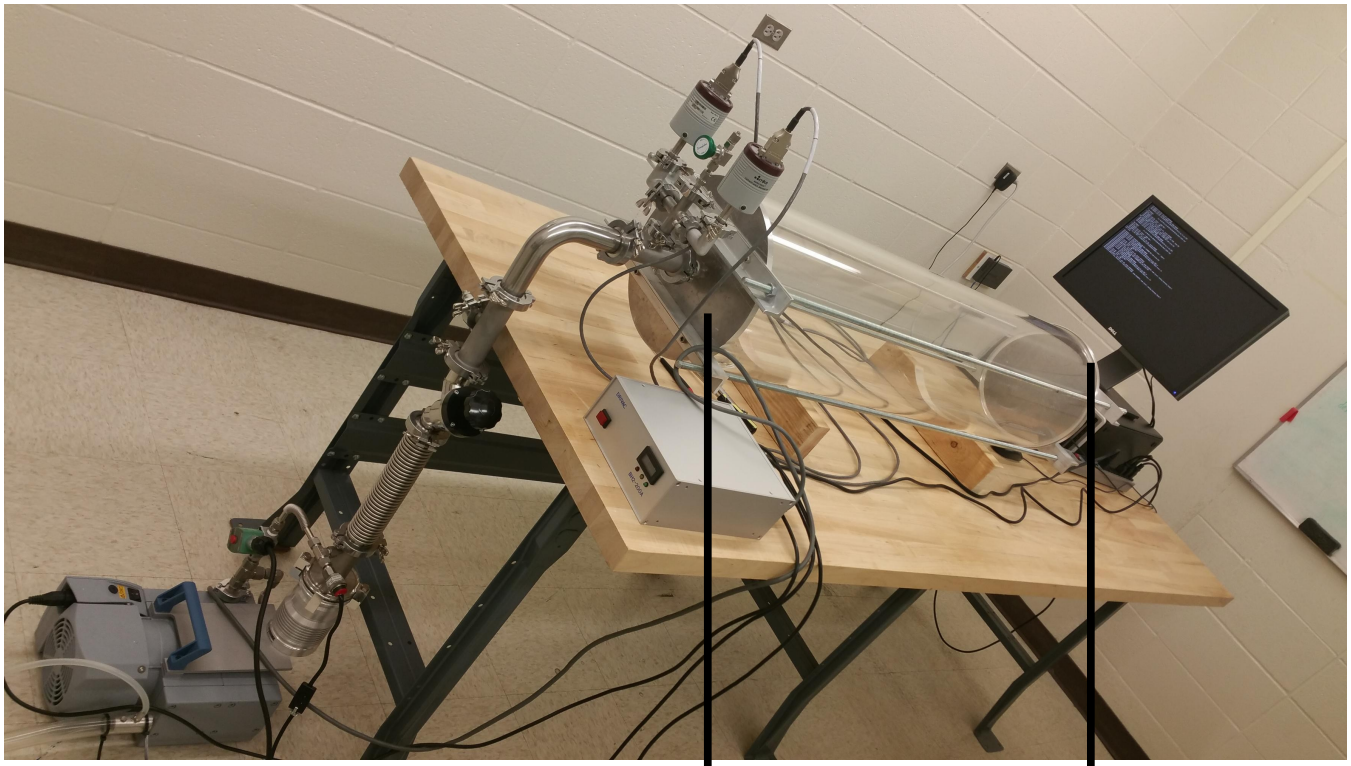




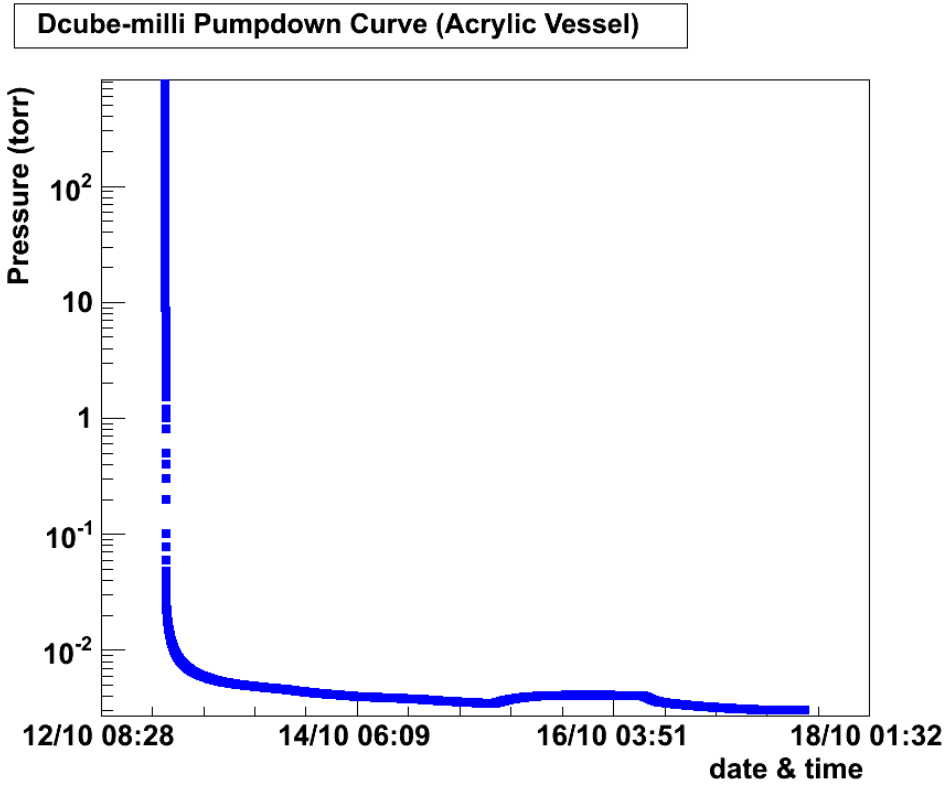
- Take away is that the gain stability becomes better as the outgassing decreases but it takes a long time (very)

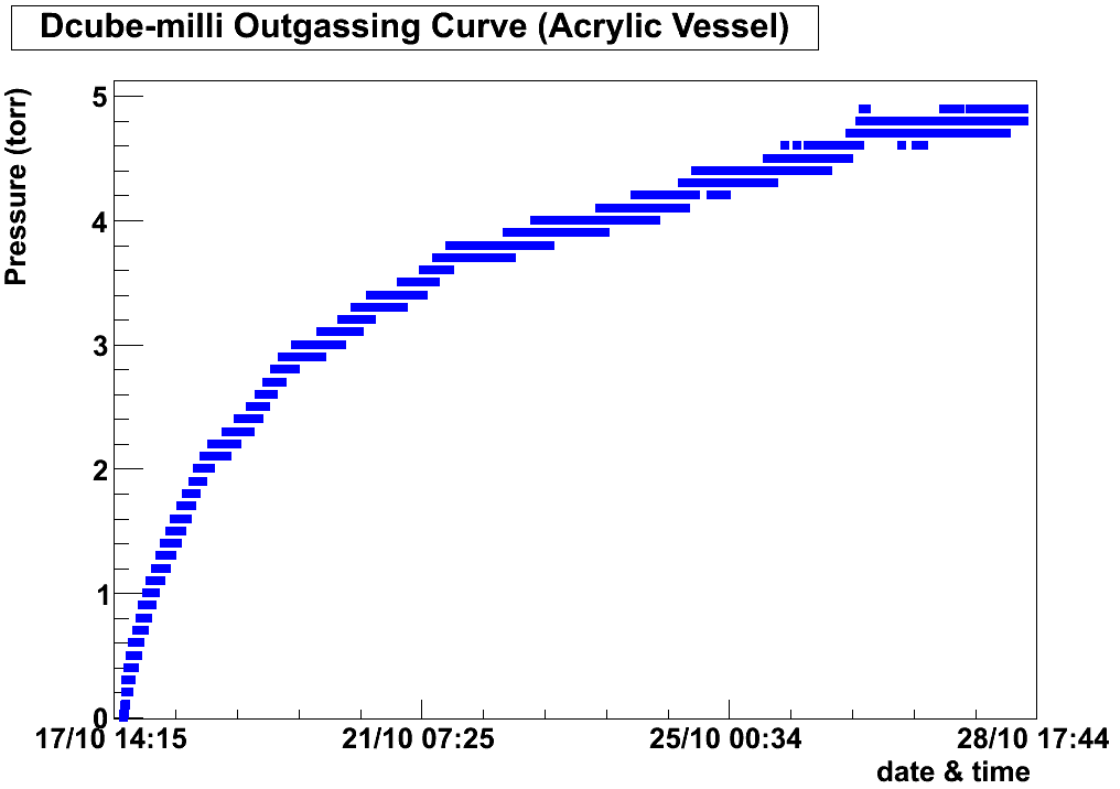
D^3 - milli (Acrylic Vessel)





Acrylic Vessel Pressure Curves





Summary

- No gain with thin GEMs yet
  - Lots of sparking
  - Try with thick GEMs...
- SF_6 outgasses for a very long time
- Acrylic vessel under construction
  - So far so good