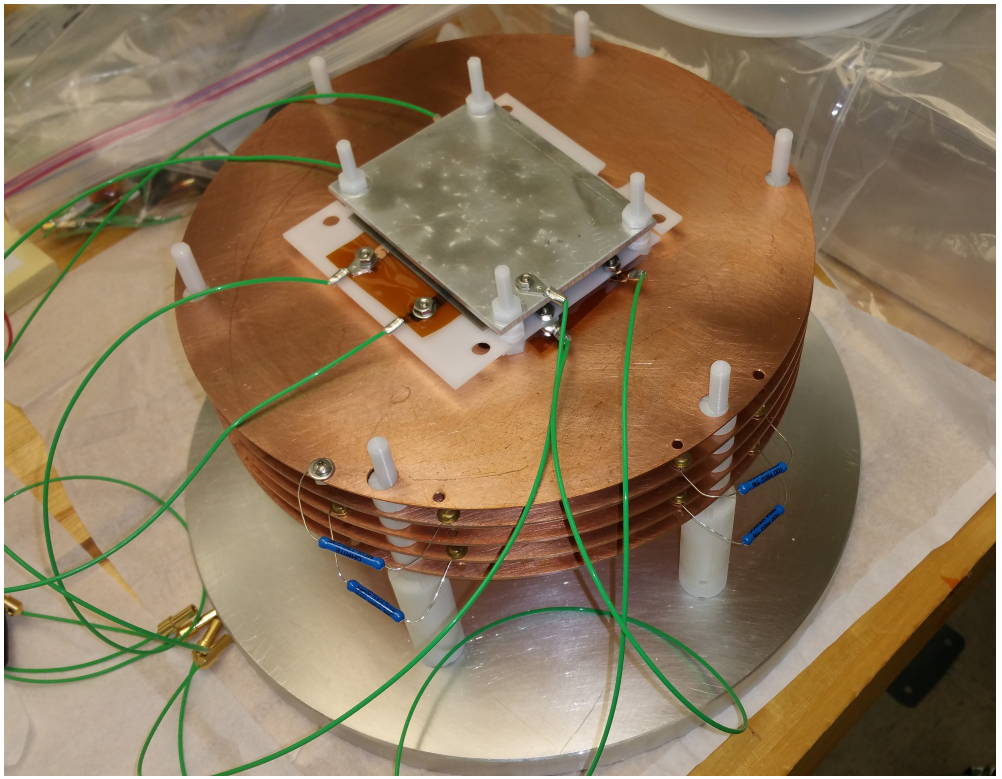
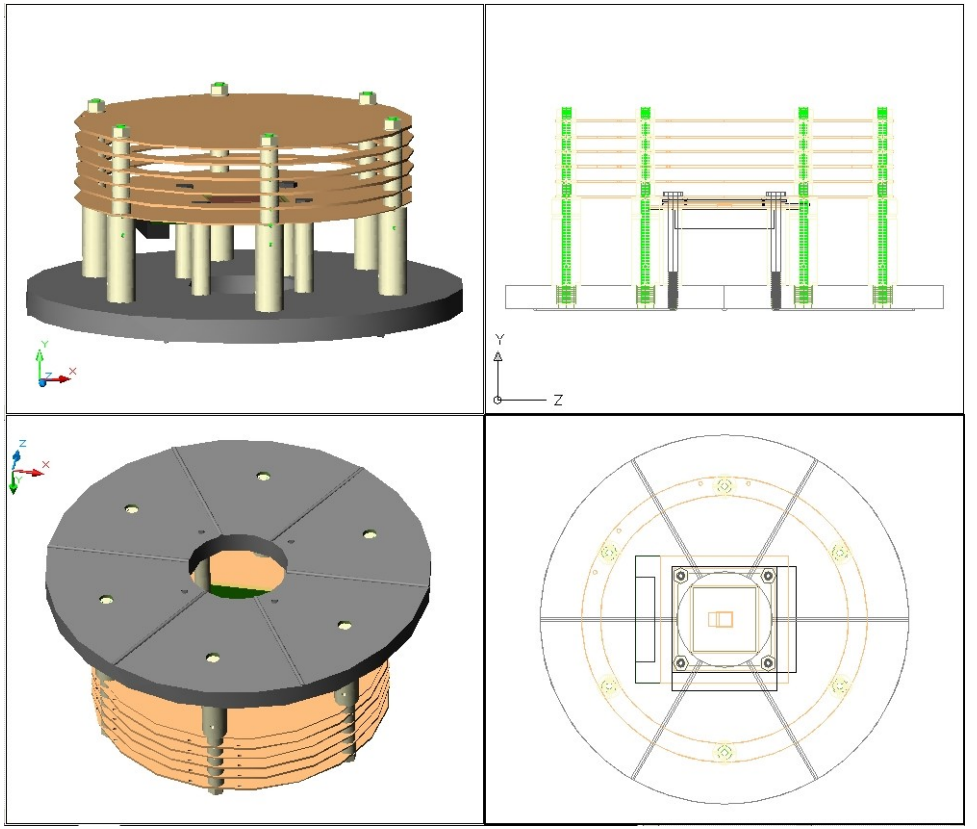
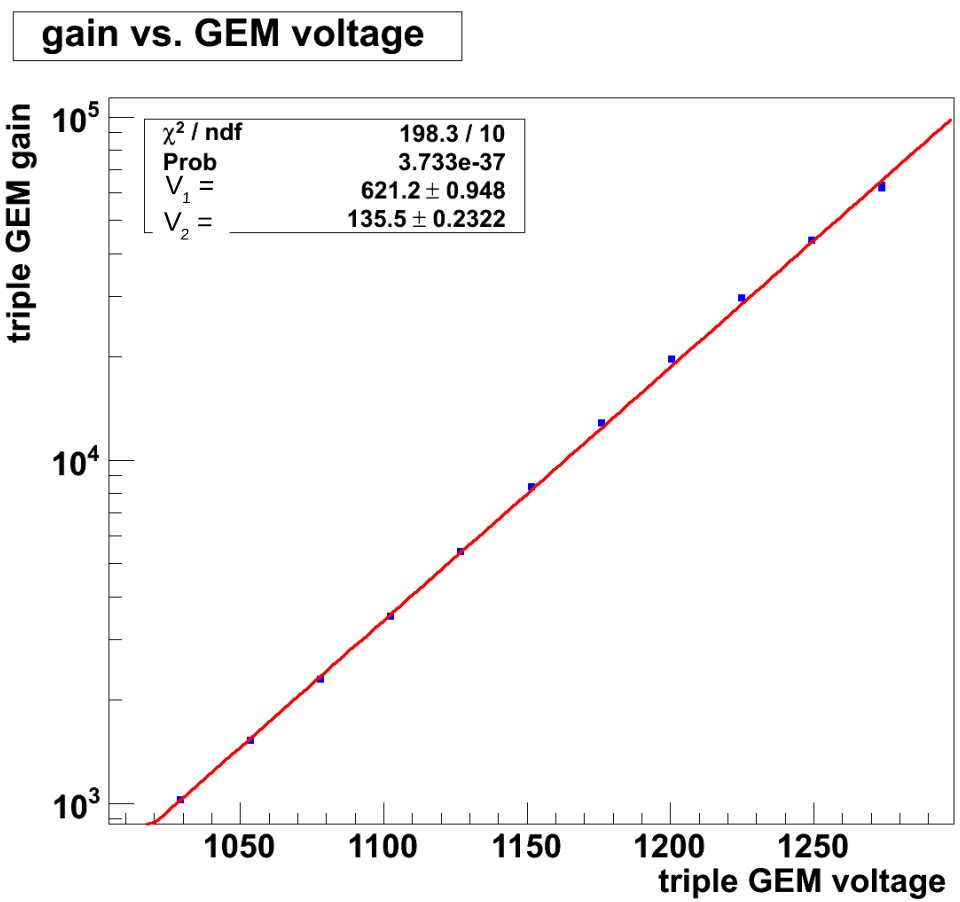
D^3 - milli stage 1

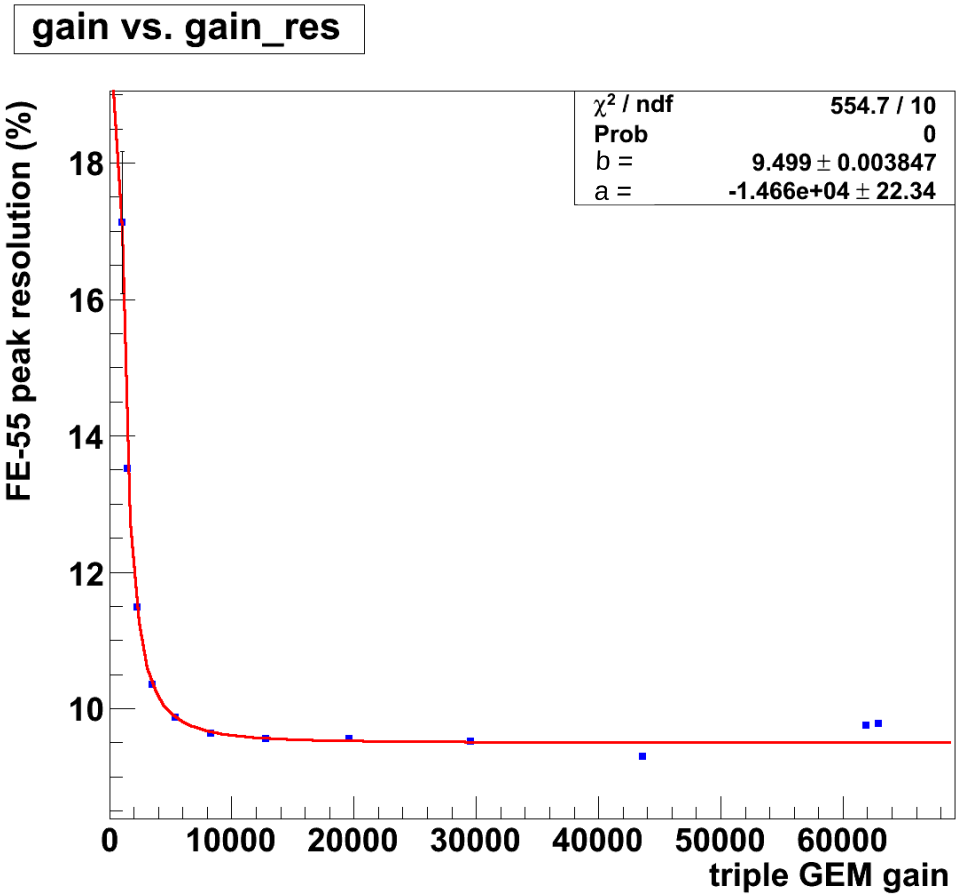
- Triple GEMs
- FE(55) source (~6keV)
- Integrating charge w/ aluminum plate
- Readout into MultiChannel Analyzer (MCA)





$HeCO_2$ Gain and Gain Resolution





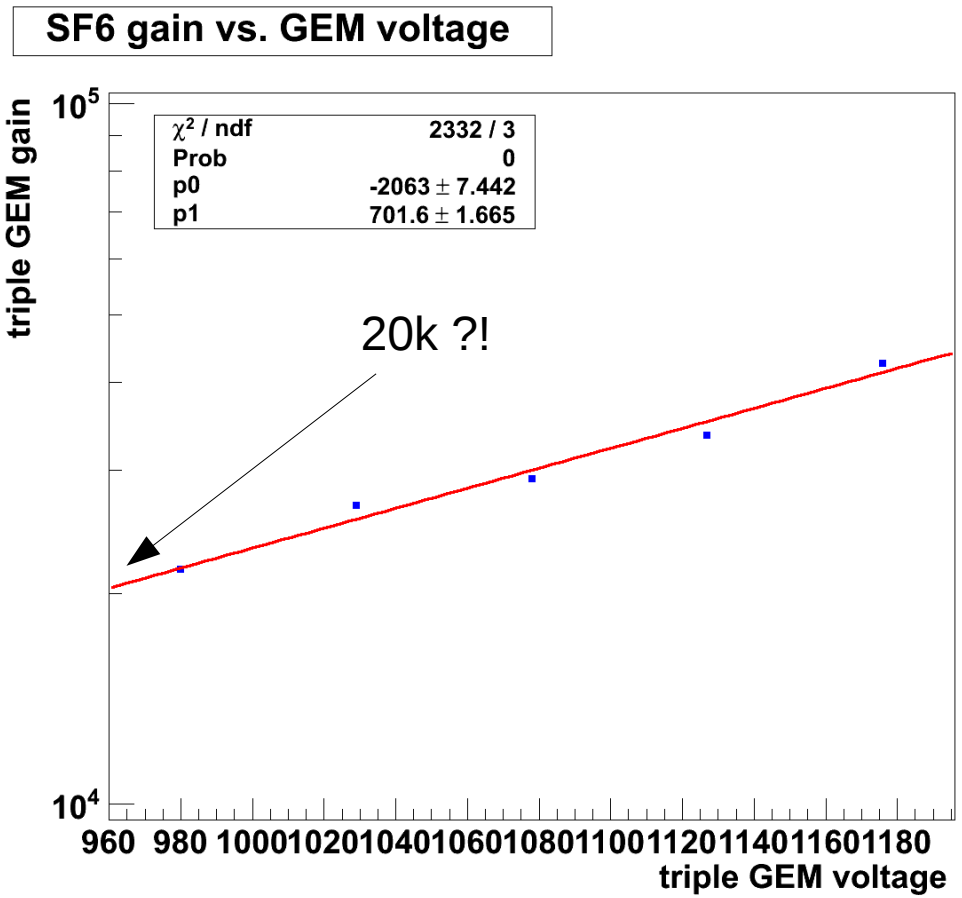
$$G = 10^{(V_{\mathrm{GEM}} - V_1)/V_2}$$

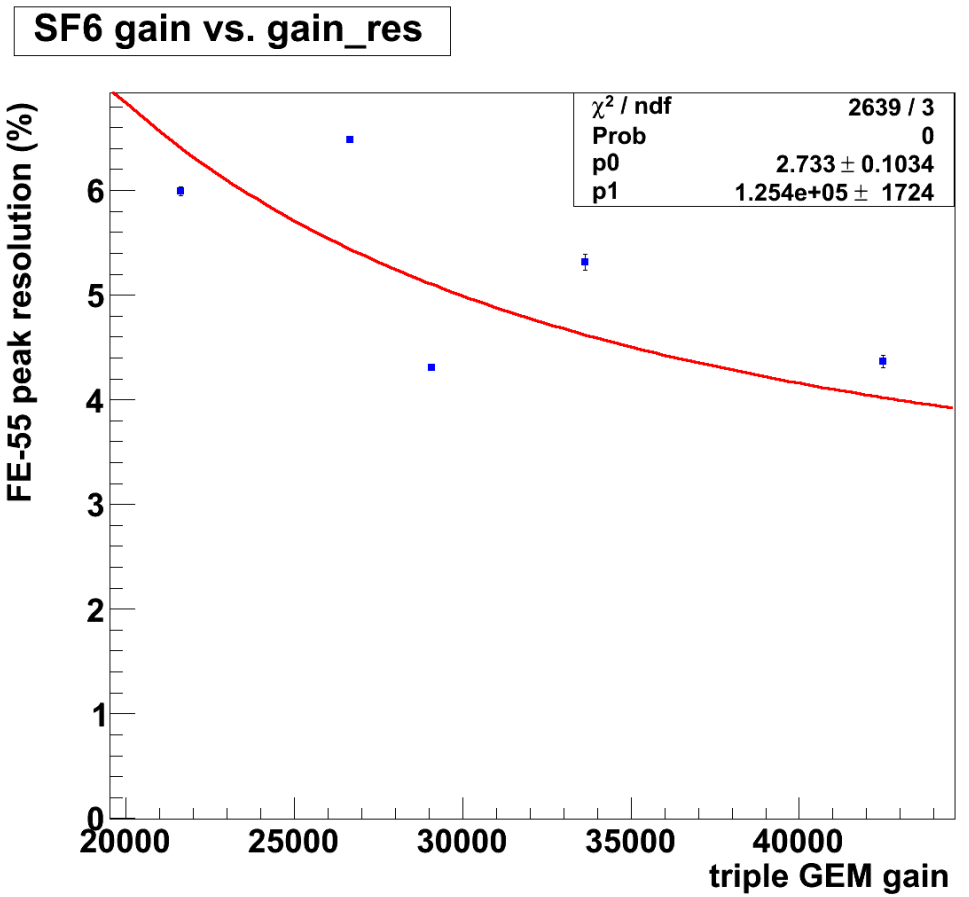
$$\sigma_G/G = \sqrt{(a/G)^2 + b^2}$$

Triple GEM Gain Study w/ SF_6

- Constant drift field
- No gas flow
- 5 min spectra taken consecutively

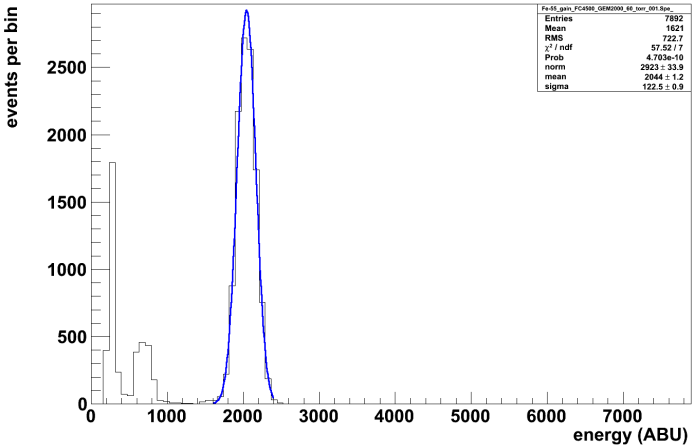
- Gain decayed within minutes
- Gain curve should be steeper
- Resolution is encouraging



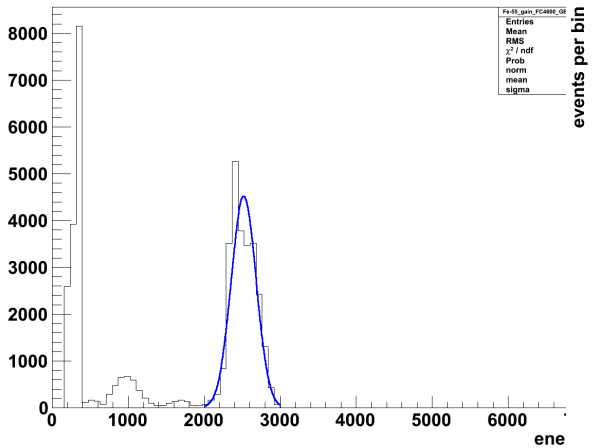


Triple GEM Gain Study w/ SF_6

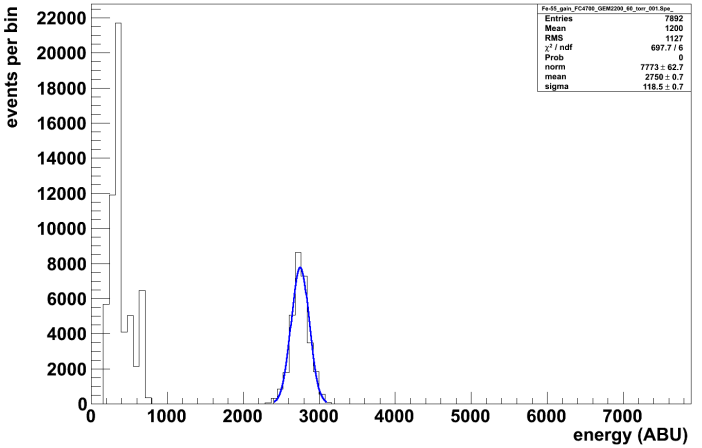
FC = 4500V; GEM = 2000V



FC = 4600V; GEM = 2100V



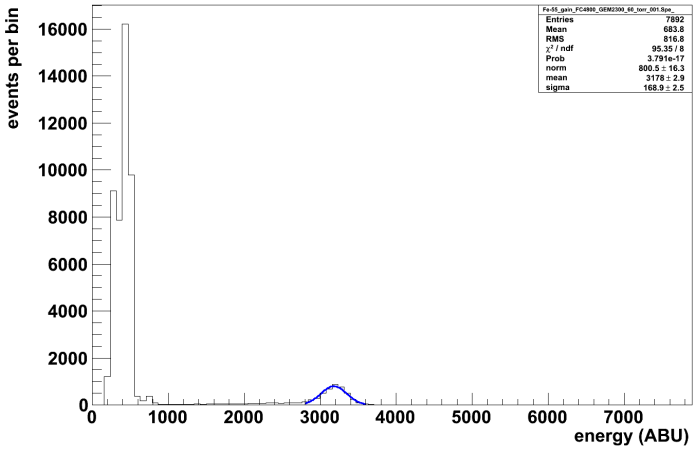
FC = 4700V; GEM = 2200V



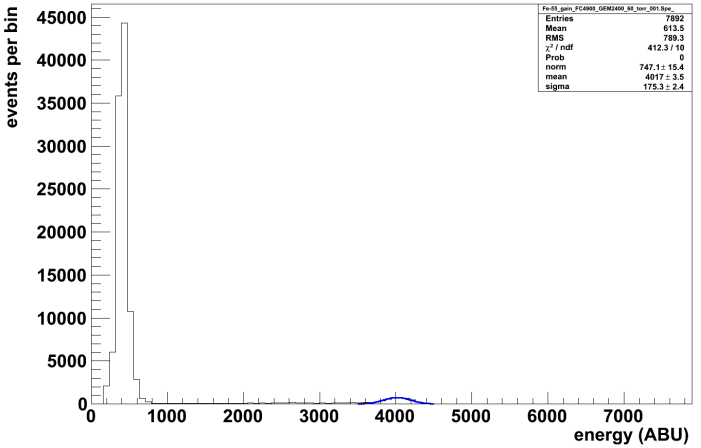
Time

*Scale is not constant

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