# Latest PEEK results

September 9, 2024

PEEK summary

- Have not been able to find something that works better than the solid chunk of PEEK for the positron arm
  - Results in a rate of ~41 kHz
  - Bulk of failures are coming out the back of the spectrometer and getting caught in the fringe field
- Best I could do with creating shapes in Fusion for the electron arm was a triangular shape
  - Resulted in a rate of ~209 kHz
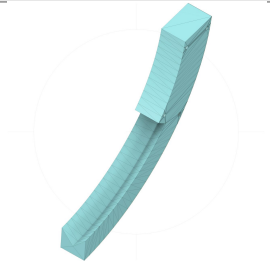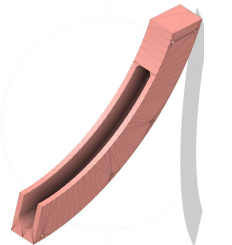 - Not feasible from a structural standpoint
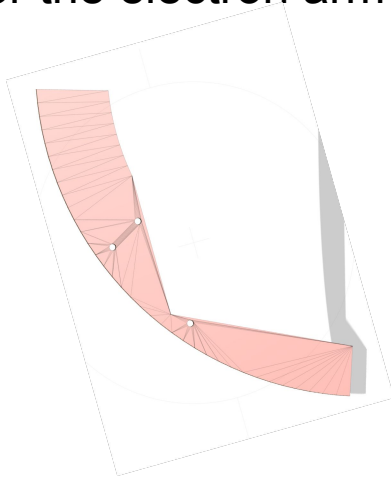
Reminder of testing G4 config

- ## On a slightly older version of the G4 geometry
  - GEMs are not quite aligned properly, and trigger position not final
  - But an okay metric, and compares directly to previous studies
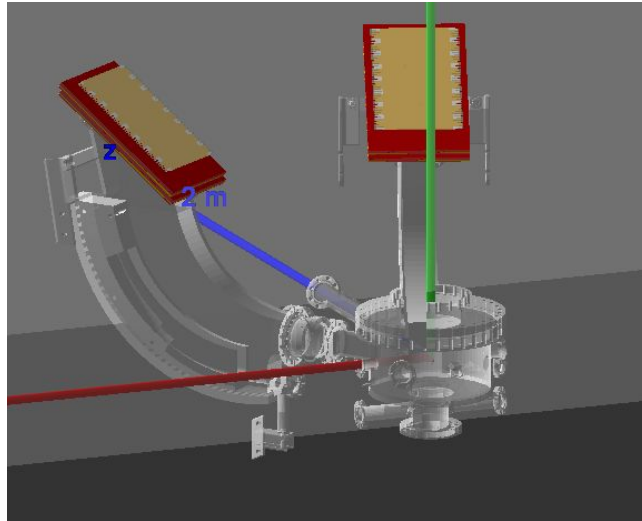
Latest e- arm designs

- A couple of iterations on designs:

Design	Rate (no trigger req.)	Rate (triggered)
V channel	293 kHz	207 kHz
U channel	350 kHz	144 kHz Electrons exiting the back of the spectrometer and going into the GEM

Adding 1cm of lead

- In order to mitigate particles coming out the back and going into the GEM, add a bit of lead directly to the back of the spectrometer arm
- Rate with lead added:
  - Without trigger requirement: 159 kHz
  - With trigger requirement: 110 kHz
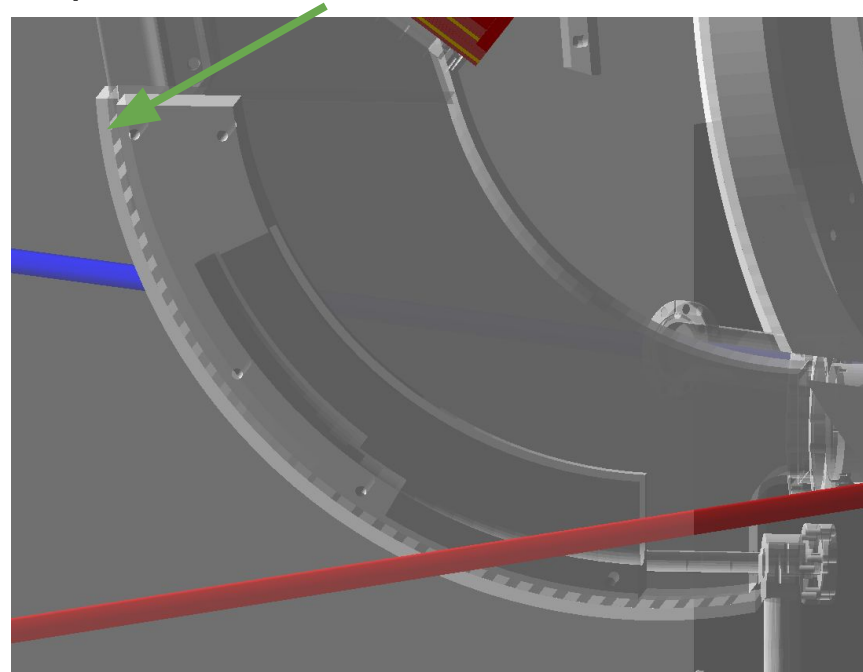
Adding poly

- If we add 1cm of poly to the back of the spectrometer instead of lead
- Rates are:
    - Without trigger requirement: 296 kHz
    - With trigger requirement: 137 kHz
- Add 2cm of poly
- Rates are:
    - Without trigger requirement: 234 kHz
    - With trigger requirement: 130 kHz

Summary of results

Design	Additional shielding	Rate (no trigger req.)	Rate (with trigger req.)
V channel	None	293 kHz	207 kHz
U channel	None	350 kHz	144 kHz
	1 cm lead	159 kHz	110 kHz
	1 cm poly	296 kHz	137 kHz
	2 cm poly	234 kHz	130 kHz

- U channel better mitigates the electrons entering the PEEK and bouncing back out and into the GEM
- For shielding material, probably would not need to cover the whole spectrometer arm back, only the critical areas
- Will see how little coverage we can get away with