

9/5/17 meeting notes

Present: Thia, Bogdan, Kijun, Marco, Graham, Steve, Nilanga, Dipangkar, Rachel, John, Jixie

Started with intro from Thia, news that Kijun is leaving for new position... welcomed Marco to the group. Marco is willing to take over from Kijun, and they have been working together for the last ~week+ to transfer information.

Bogdan described 2 detector options under consideration to reduce rate issues:

- 1) Same rTPC idea, smaller radius (Rachel to discuss)
- 2) Multiple TPC (mTPC) (Kijun to discuss), TPCs in z along target, maybe every ~10-15 cm GEM readout planes perpendicular to beam
 - a. lower efficiency but much better rate capability
 - b. Nilanga noted allows use of APV25, drift times ~1.5 microsecs
 - c. Novel - haven't seen this approach implemented before - but construction should be more straightforward than cylindrical GEM
 - d. Bogdan and Nilanga showed some ideas about pad geometry, segmentation, need double-sided readout
 - e. Use field cage along z and material budget for simulation

There is a third idea, which would put passive material in the way of protons with spiraling tracks to reduce rate.... Not to be discussed yet at this meeting.

Bogdan shared from our TDIS proposal pp. 53,54 from John Annand's simulation looking at counting rates, most of 40 MHz rate is in low energy protons - so, dividing along z should provide an immediate reduction, but still should expect 100% occupancy for inner pad (although now not more!)

- Nilanga noted that we could optimize a bit here, increase segmentation of inner radius
- Paul confused by this rate compared to rate on p. 56 - John noted that table on p. 56 uses a model of the hadronic processes in deuterium (photoproton production) calculated external to GEANT, 40 MHz is ~pure electromagnetic processes
- Critical: Will we see 40 or 400 MHz? Need to pin down!

Kijun's talk (see slides!)

- Material budget slightly different from Nilanga's (which will be posted)
- Would be good to add also plot for events in theta that make it to drift region
- Multiple hits for 150 MeV/c protons - add more material?
- Phi pattern vs momentum slide is direct hits... detection rate should be better (charge collection) - first look ~Slide 20
- First and last layers only single GEM disks
- Looks like might be useful to increase material to absorb protons, or perhaps expand distance between readout planes

We ran out of time, so agreed to meet again and hear Rachel's talk when she is back from vacation ~9/18. Thia to set up a doodle for us all.

-