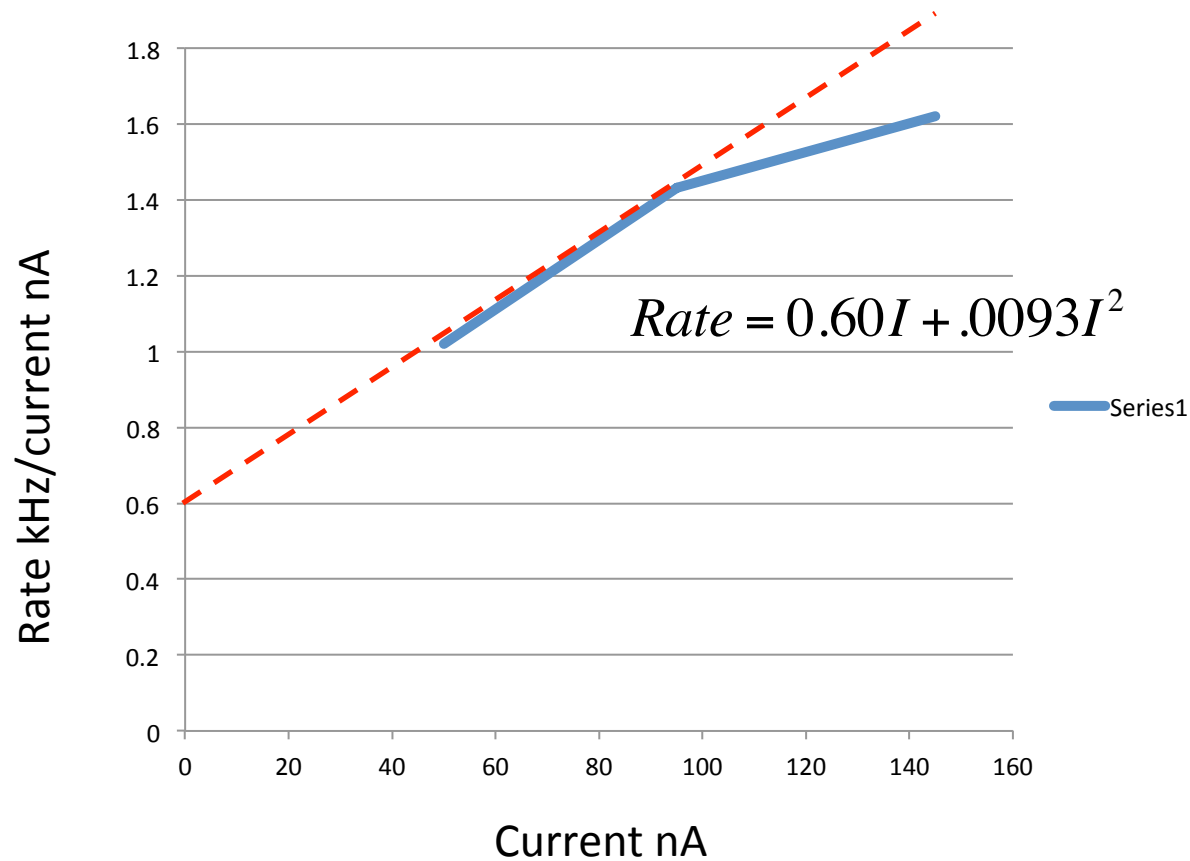


From Ilya's report:

Table 4: DAQ rates and reduction factor for additional TOF hit selection.

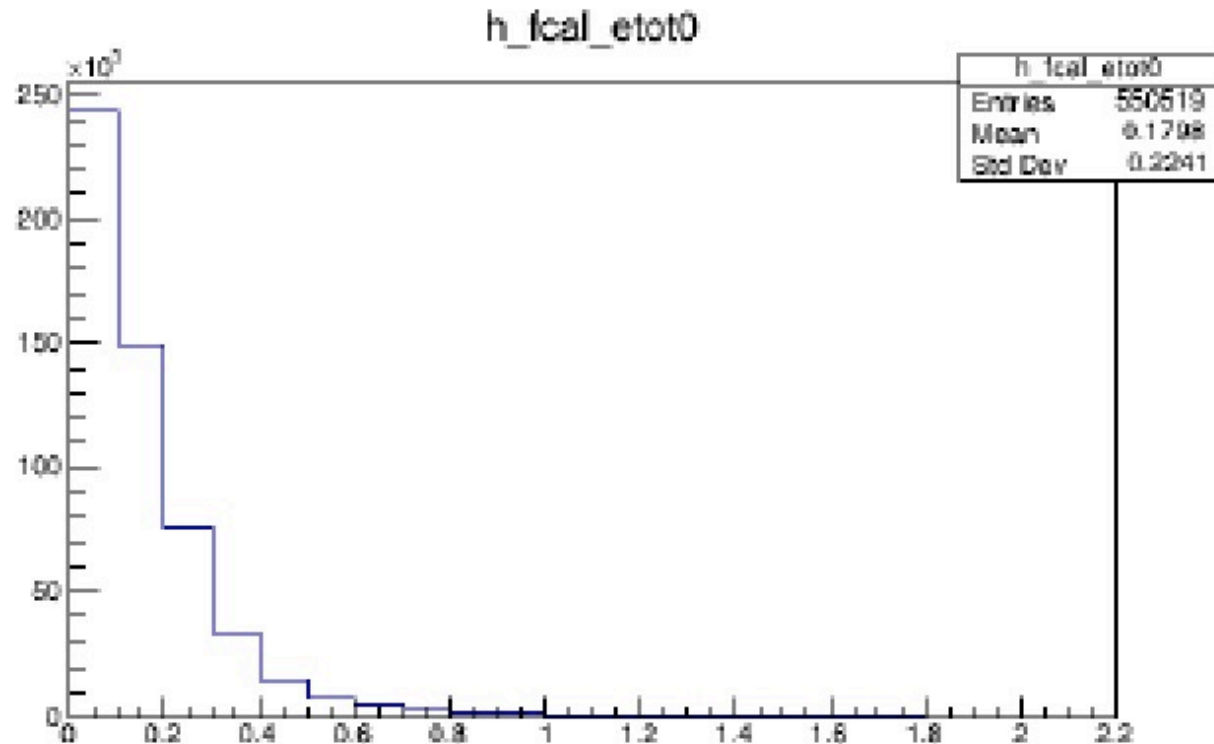
Beam current	50nA	95nA	145nA
DAQ rate	51kHz	136kHz	235/191/157kHz
Hit amplitude threshold	30mV	30mV	30/60/90mV
additional TOF hit selection:	remaining rate:		
Min 2 hits in each TOF plane (cumulative with the conditions below)	90%	89%	88%
at least 2 TOF reconstructions	94%	90%	87%
at least 2 TOF reconstructions and R>18cm cut	61%	57%	55%
at least 2 TOF reconstructions out of 18x18cm center	80%	75%	73%
at least 2 TOF reconstructions out of 18x18cm center and R>18cm cut	47%	44% 60 kHz	42%
trigger pattern 0xF000F000			4.2%
trigger pattern 0x10001000			1.1%
trigger pattern 0xFE7FFE7F			28.4%



- Rate is mostly “I” dependent up to 65 nA, and “I²” dependent beyond 65 nA.
- If the coincidence window on the TOF paddles is reduced from 40 ns to 20 ns, then the rate equation becomes $Rate = 0.60I + .0047I^2$: reduction in trigger rate by a factor of 0.73.

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The above with 20 ns TOF coincidence window	44 kHz		
The above with 5% RL target	64 kHz		



FCAL energy deposition for TOF trigger events

- Almost half the triggers have energies below 100 MeV
- The CSDA range for 100 MeV electrons in iron is approx. 1.5"
- Should we put a 1.5" thick steel plate in front of the TOF covering approximately 60" x 60", the size of the MWPCs ? Need to understand the possible negatives in doing this.

Tentative Conclusions

- Trigger rates under 90 kHz are possible if,
 - i. the trigger can reject events with $R < 18$ cm,
 - ii. the TOF scintillators are pulled back 18 cm from the beam hole,
 - iii. the coincidence window between TOF paddles is reduced to 20 ns.
- More trigger tests are needed this fall with a 5% RL target pulled back to $z = 1$ cm.
- We should advocate for the TOF modification next summer.
- A 1.5" thick steel plate in front of the TOF might reduce the rate by 50%. Could do a test this fall on a few paddles if there's time.