Simultaion studies update dRICH

Chandradoy Chattejee on behalf of dRICH simulation team

https://indico.bnl.gov/event/25662/

dRICH performance: input

+ PIDs: [2212, 321, 211, 11]

- Momentum (74 bins): [0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, 13.5, 14.0, 14.5, 15.0, 15.5, 16.0, 16.5, 17.0, 17.5, 18.0, 18.5, 19.0, 19.5, 20.0, 20.5, 21.0, 21.5, 22.0, 22.5, 23.0, 23.5, 24.0, 24.5, 25.0, 25.5, 26.0, 26.5, 27.0, 27.5, 28.0, 28.5, 29.0, 29.5, 30.0, 30.5, 31.0, 32.0, 34.0, 36.0, 38.0, 40.0, 42.0, 44.0, 46.0, 48.0, 50.0, 55.0, 60.0]
- Pseudorapidity: [1.5-3.5] in 0.1 steps
 - Example $1.5 \Rightarrow$ bin of 1.499 to 1.501
- Bin details in Google Sheet and analysis root files at link
- Negative pions simulated for charge independence study for fewer kinematic values

R. Kumar

dRICH Simulation Meeting

November	2024	

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GPU Specifications

СРИ	Intel(R) Xeon(R) Gold 6130 CPU @ 2.10GHz
CPU Max	3.7 GHz
CPUs	64
Phys. Mem	188 GB
Storage	1.8 TB x 2
GPU	Tesla V100 with 32 GB memory

12 hours/day available for EIC and ePIC related activities. All 64 cores are in use.

All analysis files are stored (some simulation and reconstruction files are also saved).

Swp[OK/8.000] Load average: 64.83 60.71 38.05 Uptime: OS:05:25 PID USER PRI NI VIRT RES CPUXVERM TIME+ Command 7421 samuel 20 0 2033H 2306H 290H PI.1 12.1316.24 Dython /opt/software/Linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytq2jmsouvcqy/bin/npsin.py -rumType runcompactFile 7421 samuel 20 0 2757M 2442H 291H 9 5.0 1.3<1314.41	1[2[3[Mem[100.0%] 100.0%] 100.0%]	5[6[7[100.0% 100.0% 100.0%] 9[] 10[] 11[100.0% 100.0% 100.0%] 13[] 14[] 15[100.0% 100.0% 100.0%	17 17 18 19	[100.0%] [100.0%] [100.0%]	21[10 22[10 23[10	0.0%] 0.0%] 0.0%]	25[100. 26[100. 27[100.	.0%] .0%] .0%]	29[100. 30[100. 31[100. 133G/18	0%] 0%] 0%] 39G] T	33[100 34[100 35[100 asks: 4	.0%] .0%] .0%] 31, 4	37[10 38[10 39[10	0.0%] 0.0%] 0.0%] 0.0%]	41[10 42[10 43[10 cthr; 0	00.0%] 00.0%] 00.0%] 00.0%]	45[10 46[10 47[10 9	0.0%] 0.0%] 0.0%]	49[100 50[100 50[100 51[100	.0%] .0%] .0%]	53[100 53[100 54[100 55[100	.0%] .0%] .0%]	57[100 58[100 58[100 59[100	0.0%] 0.0%] 0.0%]	61[100. 62[100. 63[100.	0%] 0%] 0%]
PID USER PRI NI VIRT RES SHR S CPUX/NEWS TIME Command 7421 samuel 20 0 2633M 2306M 97.1 1.2 13:16.24 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType run -compactFile 7392 samuel 20 0 2757M 2442M 291M P 5.5 1.2 13:114.31 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType run -compactFile 7401 samuel 20 0 818M 29.1 10:1114.32 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run -compactFile 8418 samuel 20 0 2754H 241H 290H 5 1.1 1.0 0:062.44 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run -compactFile 8397 samuel 20 0 2753H 242H	Swp[n I/O													0K/8.0	00G] L0 U	oad ave ptime:	rage: 05:05	64.83 :25	60.71	38.05											
7421 samuel 20 6 2038 2306 290H 9 7.1 1.2 1316.24 python /opt/software/linux-debian12-x86.64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run -compactFile 7392 samuel 20 0 2700H 2832H 291H P 55. 1.2 1315.09 python /opt/software/linux-debian12-x86.64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run -compactFile 7419 sanuel 20 0 275H 2442H 291H P 1.0 13114.41 python /opt/software/linux-debian12-x86.64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run -compactFile 8544 samuel 20 0 275H 244H 290H 5 1.1 1.3 0:02.47 python /opt/software/linux-debian12-x86.64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run -compactFile 8414 samuel 20 0 2734H 244H 290H 5 1.3 0:02.44 python /opt/software/linux-debian12-x86.64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run	PI	D USER	P	RI NI	VIRT	RES	SHR S	S CPU%	MEM%	TIME+	Command																					
7392 sanuel 20 0 2700M 282M 287M 9.5 5.2 1.2 1315.09 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 7419 sanuel 20 0 2757M 2442M 291M R 95.0 1.3 1314.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 7401 sanuel 20 2754M 248M 8 0.0 2:28.12 (sanuel/tai) 0 2754M 249M 9 1.0 1.3 0:2.47 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8418 sanuel 20 0 2754M 240M 281M S 1.1 1.2 0:62.44 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8399 samuel 20 0 2764M 248M S 0.5 1.3 0:62.36 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py	742	1 samuel		20 0	2633M	2306M	290M F	97.1	1.2	13:16.24	python	/opt/so	ftware/1	linux-0	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp;	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	pyr	unType	run -	<pre>-compactF</pre>	ile /
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7401 sanuel 20 0 2269M 1944M 280M R 92.9 1.0 13:14.32 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run -compactFile 8544 sanuel 20 0 2754M 2441M 290M S 1.1 1.3 0:02.47 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run -compactFile 8418 sanuel 20 0 2754M 2441M 290M S 1.1 1.2 0:02.47 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run -compactFile 8397 sanuel 20 0 2734 2420M 280M S 5 1.3 0:02.33 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcq/bin/npsim.py runType run -compactFile 8397 sanuel 20 0 2734M 244M 280M S 5 1.2 0:02.41 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqyaf4cp425jnytqzjmsouvcq/bin/npsim.py runType run -compactFile 8401 sanuel 20 0 2578M 2252M 287M S 6.5 1.2 0:02.41 python /opt/software/linux-debian12×86_64_v2/gcc-12.2.0/nps	741	9 samuel		20 0	2757M	2442M	291M F	95.0	1.3	13:14.41	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	pyr	runType	run -	-compactF	ile /
8544 sanuel 20 0 8168 6144 3072 R 20.7 0.0 2:28.12 (sanp/htop/4407/usr/local/bin/htop 8418 sanuel 20 0 27544 2441M 290M S 1.1 1.0 0:22.77 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType runcompactFile 8418 sanuel 20 0 2732M 2420M 291M S 0.5 1.3 0:82.36 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType runcompactFile 8399 sanuel 20 0 2734M 2420M 291M S 0.5 1.3 0:82.36 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType runcompactFile 8401 sanuel 20 0 2581M 2380H S 0.5 1.2 0:82.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytq2jmsouvcqy/bin/npsim.py runType runcompactFile 8403 sanuel 20 0 2581M 2580 K 0.5 1.2 0:82.43 python /opt/software/li	740	1 samuel		20 0	2269M	1944M	288M F	92.9	1.0	13:14.32	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq	zjmsouvc	qy/bin	/npsim.	pyr	runType	run -	-compactF	ile /
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8397 samuel 20 0 2732M 2420M 291M 5 0.5 1.3 0:0:0:2.39 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8399 samuel 20 0 2740M 2424M 288M 5 0.5 1.3 0:0:0:2.36 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8401 samuel 20 0 258M 238M 5 0.5 1.2 0:0:0:41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8403 samuel 20 0 2578M 252M 287M 5 1.2 0:0:0:43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8407 samuel 20 0 276M 238M 5 1.2 0:0:0:43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngyaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8408 samuel 20 0 276M 239M 291M 5<	842	1 samuel		20 0	2653M	2330M	287M \$	5 1.1	1.2	0:02.44	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	руг	runType	run -	-compactF	ile /
839 sanuel 20 0 2740H 2424H 288H S 0.5 1.3 0:02.36 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngqyaf4cf25jnytqzjnsouvcqy/bin/npsin.py runType runcompactFile 8401 samuel 20 0 2568H 236M 288H S 0.5 1.2 0:02.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngqyaf4cf25jnytqzjnsouvcqy/bin/npsin.py runType runcompactFile 8403 samuel 20 0 2578H 2252H 287H S 0.5 1.2 0:02.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngqyaf4cf25jnytqzjnsouvcqy/bin/npsin.py runType runcompactFile 8408 samuel 20 0 2616H 239H 288H S 0.5 1.2 0:02.49 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngqyaf4cf25jnytqzjnsouvcqy/bin/npsin.py runType runcompactFile 8408 samuel 20 0 263H 236M 288H S 0.5 1.2 0:02.40 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkngqyaf4cf25jnytqzjnsouvcqy/bin/npsin.py runType runcompactFile 8410 samuel 20 0 263H 236M 288H S 0.5 1.2 0:02.41	839	7 samuel		20 0	2732M	2420M	291M S	5 0.5	1.3	0:02.33	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq	zjmsouvc	qy/bin	/npsim.	руг	/unType	run -	-compactF	ile /
8401 samuel 20 0 2681/2336/2881/2336/2881/2530/td2/msouvcg//bin/npsim.py runType run -compactFile 8401 samuel 20 0 2578/2252/2 2877/5 0.5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqz/msouvcqy/bin/npsim.py runType run compactFile 8407 samuel 20 0 2767/l 2395/l 2397/l 2395/l 231/l 2 0.5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqz/msouvcqy/bin/npsim.py runType run compactFile 8408 samuel 20 0 2767/l 2395/l 231/l 2 0.5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqz/msouvcqy/bin/npsim.py runType run compactFile 8408 samuel 20 0 2767/l 2395/l 231/l 5 0.5 1.2 0:02.40 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqz/msouvcq/bin/npsim.py runType run compactFile 8410 samuel 20 0 2680/l 2881/l 288/l 5 0.5 1.2 0:02.40 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqz/msouvcg/bin/npsim.py runType run compactFile 8410 samuel	839	9 samuel		20 0	2740M	2424M	288M \$	5 0.5	1.3	0:02.36	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	руг	runType	run -	-compactF	ile /
8403 sanuel 20 0 2578H 2522H 287H 5 0.5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8407 samuel 20 0 2670H 2393H 288H 5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8408 sanuel 20 0 2707H 2395H 91H 5 1.2 0:02.43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8410 sanuel 20 0 268H 2.65 1.2 0:02.49 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8411 sanuel 20 0 268H 2.88H 5 1.2 0:02.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8411 sanuel 20 0 268H 8.65 1.2 0:02.41 python /opt/software/linux-debian12-x8	840	1 samuel		20 0	2683M	2336M	288M S	5 0.5	1.2	0:02.41	python	/opt/so	ftware/1	linux-	debian12	2-x86_(64_v2/g	cc-12	.2.0/np	sim-1.	.4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	руг	runType	run -	-compactF	ile /
8407 samuel 20 0 21604 22934 2884 S 0.5 1.2 0:02:43 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmgyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run -compactFile 8408 samuel 20 0 2707M 2995M 291M S 0.5 1.2 0:02:49 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmgyaf4cp425jnytqzjmsouvcqy/bin/npsim.py -runType run<-compactFile	840	3 samuel		20 0	2578M	2252M	287M \$	5 0.5	1.2	0:02.43	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq	zjmsouvc	qy/bin	/npsim.	pyr	/unType	run -	-compactF	ile /
8408 sanuel 20 0 2707H 2395M 291M 5 0.5 1.2 0:02.44 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8410 samuel 20 0 2683M 2369M 288M 5 0.5 1.2 0:02.44 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8411 samuel 20 0 2767M 248M 5 0.5 1.2 0:02.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrknggvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8411 samuel 20 0 2767M 2456M 290M 5 0.5 1.3 0:02.49 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmgqvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType run compactFile 8414 samuel 20 0 2767M 2456M 290M 5 0.5 1.3 0:02.49 python	840	7 samuel		20 0	2616M	2293M	288M \$	5 0.5	1.2	0:02.43	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq	zjmsouvc	qy/bin	/npsim.	руг	/unType	run -	-compactF	ile /
8410 samuel 20 0 2683H 2369M 288M 5 0.5 1.2 0:0:2.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8411 samuel 20 0 26269M 288M 5 1.2 0:0:2.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8414 samuel 20 0 2767M 2456M 290M 5 1.3 0:02.49 python /opt/software/linux-debian12-x86 64 v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqqvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8414 samuel 20 0 2767M 2456M 290M 5 1.3 0:02.49 python /opt/software/linux-debian12-x86 64 v2/gcc-12.2.0/npsin-1.4.1-gpjrkmqqvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile	840	8 samuel		20 0	2707M	2395M	291M S	5 0.5	1.2	0:02.40	python	/opt/so	ftware/1	linux-	debian12	2-x86_(64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp;	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	руг	/unType	run -	-compactF	ile /
8411 samuel 20 0 2629M 2281M 288M S 0.5 1.2 0:02.41 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile 8414 samuel 20 0 2767M 2456M 290M S 0.5 1.3 0:02.49 python /opt/software/linux-debian12-x86_64_v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqgvaf4cp425jnytqzjmsouvcqy/bin/npsim.py runType runcompactFile	841	0 samuel		20 0	2683M	2369M	288M \$	5 0.5	1.2	0:02.44	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	pyr	/unType	run -	<pre>-compactF</pre>	ile /
8414 samuel 20 0 2767M 2456M 290M S 0.5 1.3 0:02.49 python /opt/software/linux-debian12-x86 64 v2/gcc-12.2.0/npsim-1.4.1-gpjrkmqqvaf4cp425jnytqzjmsouvcqy/bin/npsim.pyrunType runcompactFile	841	1 samuel		20 0	2629M	2281M	288M \$	5 0.5	1.2	0:02.41	python	/opt/so	ftware/1	linux-	debian12	2-x86_0	64_v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmqgv	af4cp42	5jnytq:	zjmsouvc	qy/bin	/npsim.	руг	/unType	run -	<pre>-compactF</pre>	ile /
	841	4 samuel		20 0	2767M	2456M	290M \$	5 0.5	1.3	0:02.49	python	/opt/so	ftware/1	linux-	debian12	2-x86 (64 v2/g	cc-12	.2.0/np	sim-1.	4.1-gp	jrkmagv	af4cp42	5jnytq	zjmsouvc	qy/bin	/npsim.	руг	unType	run -	-compactF	ile /

dRICH performance: input

Summary of dRICH analysis for EIC

Deepak Samuel, Ramandeep Kumar, Meenu Thakur, Chandradoy Chatterjee

November 21, 2024

Abstract: This document contains the scope, results and the summary of the dRICH analysis work in the context of EIC, which was jointly performed by the teams at Central University of Karnataka and Central University of Haryana, under the active guidance of Chandra. This also contains links to locuments and datasets used or generated in the analysis. This document is expected to evolve as results keep coming in.

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Version by Date 1.0 D.Samuel 12 Nov 2024

Comments 2024 First results including separation power analysis for different aerogels, photon statistics, charge dependence

Use of GPU for Simulation

https://github.com/deepaksamuel/drich-hepmc

Code © Issues 1 Pull requests O Actions E Projects © Security > Insights Code © Issues 1 Pull requests O Actions E Projects © Security > Insights Image: Code © Issues 1 Pull requests O Actions E Projects © Security > Insights Image: Code Image: Code Image: Code Image: Code Image: Code Image: Code Image: Projects Image: Code Image: Code

- Use of GPU for event simulation
- Production of HEPMC files
- Thanks to basis script & guidance from Chandra & significant efforts from Deepak
- Event generation is being done (for pions, kaons, protons and electrons)

https://github.com/deepaksamuel/drich_analysis_files

E C deepaksamuel / drich_analysis	_files
<> Code ⊙ Issues 11 Pull requests	⊙ Actions 🖽 Projects 🕛 Security 🗠 Ins
• Files	drich_analysis_files / 00 / plots / 🖓
₿° master → + Q	CUK GPU First commit
Q Go to file	
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v E plots	ana.reco.sim.211_0.5_0.plots
> ana.reco.sim.211_0.5_0.plots	ana.reco.sim.211_0.5_1.plots
> ana.reco.sim.211_0.5_1.plots	ana.reco.sim.211_1.5_0.plots
ana.reco.sim.211_1.5_0.plots	
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> 🖿 ana.reco.sim.211_10.5_1.plots	ana.reco.sim.211_10.5_1.plots
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> ana.reco.sim.211_11.5_0.plots	ana.reco.sim.211_10_1.plots
> ana.reco.sim.211_11.5_1.plots	ana.reco.sim.211_11.5_0.plots
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> ana.reco.sim.211_12.5_1.plots	ana.reco.sim.211_11_1.plots

• The HEPMC files are also accessible to other members of the group for their use

dRICH separation power : gas



50

p [GeV]

30

55

4. <14-16GeV> for e/pi seperation in gas

dRICH separation power: Aerogel

18

p [GeV]

20

22

24

3.50

3.25

3.00

2.75

2.50

2.25

2.00

1.75





1. T.Boasso suggested aerogel 1.026 performs better than 1.019. Large data set studies validated such observations. 2. Almost 2 GeV improvement. No noise added so far (will be checked).

3. Aerogel 1.026 has at higher photon count, $\sim 50\%$

4. Photon ratio of pions and protons follows F&T law, way to cross-check the simulation and beam test results.

Single photon resolution: Chromatic

еггог

Analysis details

- To calculate the contribution of chromatic aberration I ran simulations both with the refractive index fixed and with the lambda dependency.
- 1000 events.
- PID: 211
- Momentum fixed:
 - For gas @ 50 GeV/c.
 - For aerogel @ 15 GeV/c.
- \bullet Different bins of $\eta.$

4.89411*ev	1.001406	
6.19921*eV	1.001489	
	"ABSLENGTH_	_C4F10_PFRICH" coldim="2" values="
1.23984*eV	6.0*m	
6.19921*eV	6.0*m	
		density=0.11 g/cm3>
	"RINDEXAe	rogel_DRICH" coldim="2" values="
1.23984*eV	1.01826	
1.28348*eV	1.01828	
1.33030*eV	1.01829	
1.38067*eV	1.01831	
1.43500*eV	1.01833	
1.49379*eV	1.01835	
1.55759*eV	1.01838	
1.62709*eV	1.01840	
1.70308*eV	1.01844	
1.78652*eV	1.01847	
1.87855*eV	1.01852	
1.900/3*eV	1.01856	
2.05490*eV	1.01861	
2.14308-eV	1.01800	
2.23120-eV	1.01071	
2.31743-ev	1.01070	
2.40701-eV	1 01001	ania/acmnact/antial materials yml
2.58396*eV	1.01893	epic/compact/optical_materials.xmt
2.67214*eV	1.01899	
2.76032*eV	1.01905	
2.84849*eV	1.01912	
2.93667*eV	1.01919	
3.02485*eV	1.01926	
3.11302*eV	1.01933	
3.20120*eV	1.01941	
3.28938*eV	1.01948	
3.37755*eV	1.01956	
3.46573*eV	1.01965	
3.55391*eV	1.01973	
3.64208*eV	1.01982	
3.73026*eV	1.01991	
3.81844*eV	1.02001	
3.90661*eV	1.02010	
3.99479*eV	1.02020	
4.08297*eV	1.02030	
4.17114*eV	1.02041	
4.25932*eV	1.02052	



5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 polar angle [deg]

Studies by Luisa

Single photon resolution: Chromatic

еггог

p=15 GeV/c, n=1.019 fix

2.5

3

3.5

Aerogel 1.019



Studies by Luisa

3.5

2.5

1.5

0.5

0 1.5

**

2

SPE



Chromatic Aberration Percentage Contribution vs η , p=15 GeV/c, n=1.019



Single photon resolution: Chromatic

еггог





Effect of acrylic filter will be studied.



Single photon resolution: Pixelization



Pixel contribution: 0.78 mrad ~ 0.00078 rad

Further studies will be made.

Seems compatible!



Resolution

σ_{Δθ} [mrad]

2

1.8

1.6

1.4

1.2

0.8

0.6

0.4

0.2

Overall NPE vs. Pseudorapidity for Gas



Summary

We are progressing with the simulation studies.
For the TDR we will update the plots soon.
We will soon start the IRT reconstruction updates.