

Rate Comparisons to E95-001 Observed Rate

February 16, 2009

QFS Code

Q^2 [GeV/c] ²	E [GeV]	E' [GeV/c]	θ_{sc} [deg]	I_{beam} [μ A]	(e,e') Rate [kHz]	QFS Rate [kHz]	Ratio
0.1	0.778	0.717	24.44	7.25	3.624	5.821	1.61
0.193	0.778	0.667	35.50	9.74	0.565	0.777	1.38
0.3	1.727	1.559	19.21	9.95	2.100	3.901	1.85
0.4	1.727	1.506	22.62	10.96	0.822	1.255	1.53
0.5	1.727	1.453	25.80	9.94	0.308	0.392	1.27
0.6	1.727	1.399	28.85	10.0	0.145	0.166	1.14
Average							1.46

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Q^2 [GeV/c] ²	(e,e') Rate [kHz]	Rate [kHz]	Ratio
0.1	3.624	4.956	1.37
0.193	0.565	0.898	1.59
0.3	2.100	2.478	1.18
0.4	0.822	0.978	1.19
0.5	0.308	0.367	1.19
0.6	0.145	0.183	1.26
Average			1.30

Experimental Parameters:

- Target length: 40 cm
- Target density: 10 amagats
- Solid angle: 6 msr (crudely accounted for target length dependence on angle)
- HRS momentum acceptance: $\pm 4.5\%$
- Rate calculations do not include the target cell end windows.

QFS Parameters:

- Used parameters determined for E94-010 kinematics: $\theta_{sc} = 15.5^\circ$, E = 0.862 GeV and 1.717 GeV.
- FERMI MOMENTUM [MEV/C], NUCLEON SEPARATION ENERGY [MEV], DELTA SEPARATION ENERGY [MEV]
- E = 0.778 GeV: 130.0, 20.0, 15.0
- E = 1.727 GeV: 130.0, 10.0, 15.0
- Parameters could be fine-tuned to match E95-001 rates

Rate Calculations for E08-005 and E05-102

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E [GeV]	E' [GeV/c]	θ_{sc} [deg]	Q^2 [GeV/c] ²	$ \vec{q} $ [GeV/c]	θ_{pq} [deg]	(e,e') Rate [kHz]	L/R
1.268	1.2283	12.55	0.0744	0.2757	75.5	86.65	Y/N
1.268	1.2146	14.65	0.1	0.3209	73.18	39.76	Y/N
1.268	1.2049	16	0.118	0.3498	71.71	25.78	Y/Y
1.268	1.1733	19.9	0.178	0.432	67.58	8.464	Y/Y
1.268	1.1613	21.25	0.2	0.46	66.2	5.577	N/Y
1.268	1.052	32	0.405	0.6723	56.01	0.490	N/Y
2.468	2.3221	12.55	0.274	0.5433	68.24	12.86	Y/N
2.468	2.362	15	0.397	0.6389	73.04	4.514	Y/N
2.468	2.265	15	0.381	0.6498	64.46	4.503	Y/N
2.468	2.2398	16	0.428	0.6931	62.97	2.945	Y/Y
2.468	2.2015	17.45	0.5	0.7557	60.88	1.747	Y/Y
2.468	2.133	19.9	0.629	0.8608	57.51	0.691	Y/Y
2.468	2.0683	22.1	0.75	0.9539	54.66	0.316	N/Y
2.468	1.8559	29	1.15	1.234	46.81	0.039	N/Y
3.668	3.3547	12.55	0.588	0.8284	61.64	2.771	Y/N
3.668	3.2692	14.35	0.748	0.9525	58.28	1.120	Y/N
3.668	3.1856	16	0.905	1.067	55.4	0.535	Y/Y
3.668	3.1355	16.95	0.999	1.133	53.81	0.319	Y/Y
3.668	2.8694	21.75	1.5	1.462	46.68	0.046	N/Y

Experimental Parameters:

- Target length: 40 cm
- Target density: 10 amagats
- Solid angle: 6 msr (crudely accounted for target length dependence on angle)
- HRS momentum acceptance: $\pm 4.5\%$
- Beam current: 15 μA
- Rate calculations do not include the target cell end windows
- **Red** indicates possible ${}^3\text{He}(e,e'd)$ kinematics
- Left θ_{sc} : [12.5,20] degrees and also above 32°
- Right θ_{sc} : [16,50] degrees (16 clear, 15 clips)

Rate Check for d2n Kinematics

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Q^2 [GeV/c] ²	E [GeV]	E' [GeV/c]	θ_{sc} [deg]	I_{beam} [μ A]	(e,e') Rate [kHz]	Code Rate [kHz]	Ratio
0.095	1.231	1.0	16.0	3.2	4.209	5.325	1.26

Experimental Parameters:

- Target length: 40 cm
- Target density: 10 amagats
- Solid angle: 6 msr (crudely accounted for target length dependence on angle)
- HRS momentum acceptance: $\pm 4.5\%$
- Beam current: 15 μ A (scaled to reflect actual current)
- Rate calculations do not include the target cell end windows