Comparison Sheren (Vahe) to world 9/12/23

Look at QE Peak -RL RT, and Look at QE distribution No corrections

*Q2=0 (photoproduction) – RT only RT= nu*sigma_gamma/(2 Pi^2 Alpha)*

Q2 = 0.03 (0.028-0.039) (no E04-001 data) *
Q2= 0.05 (0.039-0.060) 1.2 GeV 10.8 deg *
Q2= 0.07 (0.060-0.085) 1.2 GeV 13 deg *
Q2=0.10 (0.085-0.120) 1.2 GeV 16 deg *
Q2=0.14 (0.120-0.165) 1.2 GeV 19 deg *
Q2=0.19 (0.16-0.248) 1.2 GeV 22 deg *
Q2=0.26 (0.248-0.280) no E04-001 data) *
Q2=0.30 (0.280-0.338) 1.2 GeV 28 deg *
Q2= 0.37 (0.338-0.470) (no E04-001 data) *
Q2= 0.57 (0.470-0.660) 1.2 GeV 45 deg, 3.49 GeV 14 deg
Q2 =0.75 (0.660-0.90) 4.63 GeV 10.65 deg. 1.2 GeV 55 deg,
Q2=1.0 (0.90-1.2) 1.207 70 deg, 463 GeV 13 deg,2.35 GeV 30 deg,
3.49 GeV 20 deg, 4.63 GeV 16 deg).
Q2=0.012 (0.05- 0.028) (no E04-001 data)
low Q need: all Yamaguchi, Goldemberg, deforest, Spamer

Ready to do RL RT separation

- Make sure all Ex energies converted to Nu
- Include an updated 1.2 GeV data that is more complete
- Provide the following multiplicative corrections in the file

  Use current fit to get

(1) Data set normalizations

(2) Coulomb correction

(3) Bin centering corrections for first try at binning (to bin centers)

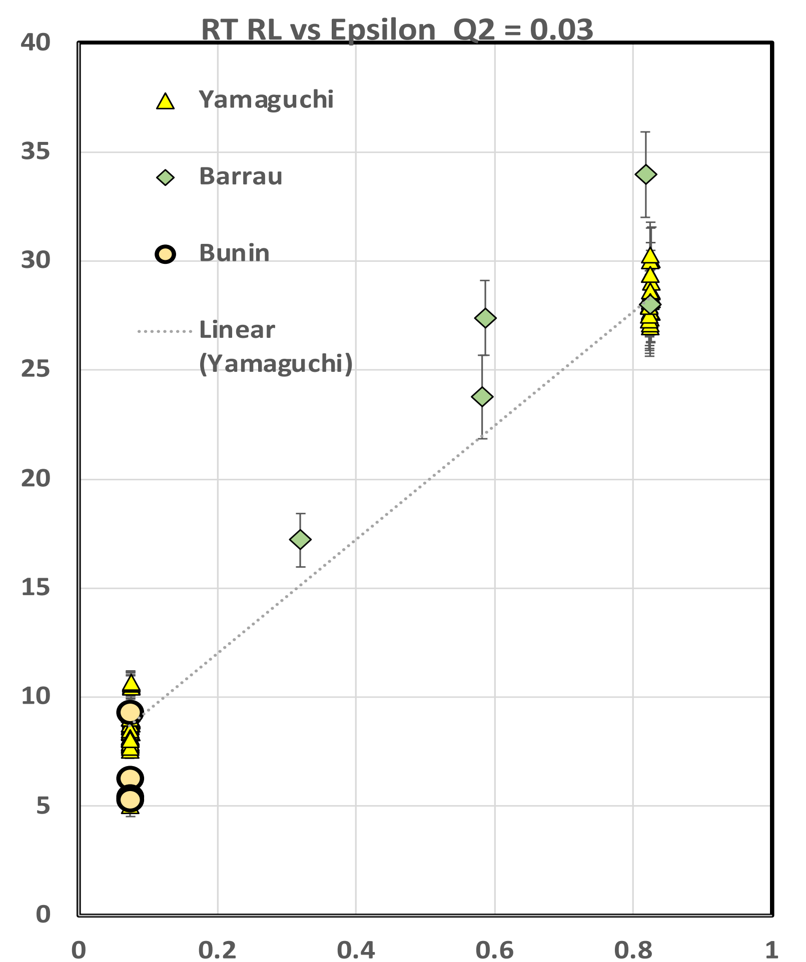
Every cross section point – determine Q2 and find what bin it is in

we to go to lowest Q2,

Can also we have a low Q data set:

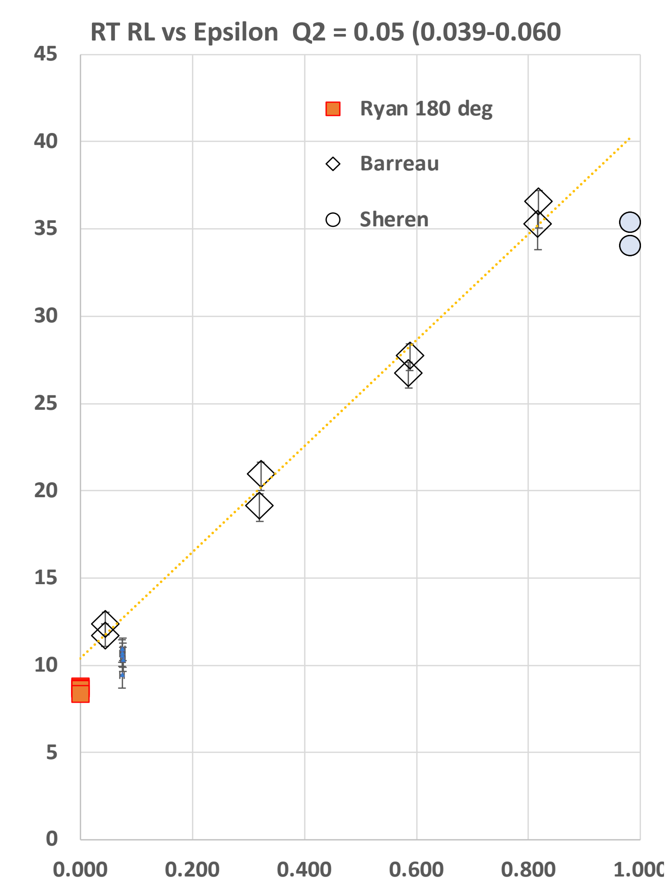
: all Yamaguchi files, Spamer, deforrest and Goldemberg

Q2=0.03 (0.028-0.039)
No E04-001 data)

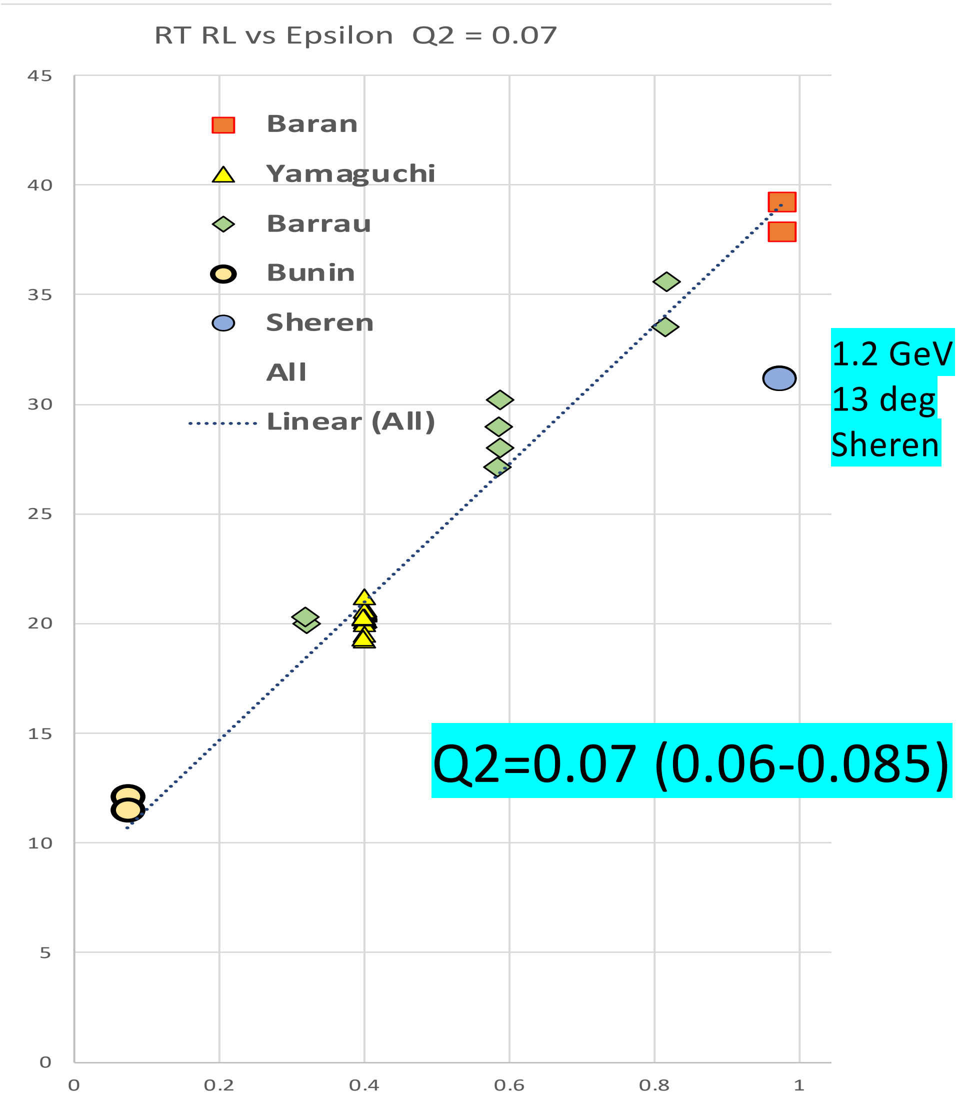


Data Set	E0	thetea	W2		Baran	Yama	Barraau	Bunin
16	0.25	35	0.9250	yamaguchu		30.0550964		
16	0.12	135	0.9252	yamaguchu		10.4898597		
16	0.1	135	0.9254	yamaguchu		8.98760146		
16	0.1	135	0.9254	yamaguchu		8.87485377		
16	0.1	135	0.9254	yamaguchu		8.35943576		
16	0.25	35	0.9254	yamaguchu		28.3833688		
16	0.12	135	0.9256	yamaguchu		10.456386		
16	0.25	35	0.9258	yamaguchu		28.6223145		
16	0.1	135	0.9258	yamaguchu		8.93074861		
16	0.1	135	0.9258	yamaguchu		8.93074861		
16	0.12	135	0.9261	yamaguchu		10.6157025		
16	0.25	35	0.9262	yamaguchu		27.6510888		
1	0.32	36	0.9262	Barrua			33.959282	
16	0.1	135	0.9263	yamaguchu		9.23688833		
16	0.1	135	0.9263	yamaguchu		9.29335839		
16	0.1	135	0.9263	yamaguchu		8.7609264		
16	0.12	135	0.9265	yamaguchu		10.5916154		
16	0.25	35	0.9266	yamaguchu		28.1932296		
16	0.1	135	0.9267	yamaguchu		9.29332809		
16	0.1	135	0.9267	yamaguchu		9.25295742		
18	0.098	135	0.9269	Bunin				6.25916247
16	0.12	135	0.9270	yamaguchu		10.6184108		
16	0.25	35	0.9270	yamaguchu		28.2310786		
16	0.1	135	0.9272	yamaguchu		9.20447611		
16	0.1	135	0.9272	yamaguchu		9.20447611		
16	0.25	35	0.9274	yamaguchu		28.5731889		
16	0.12	135	0.9274	yamaguchu		10.6580207		

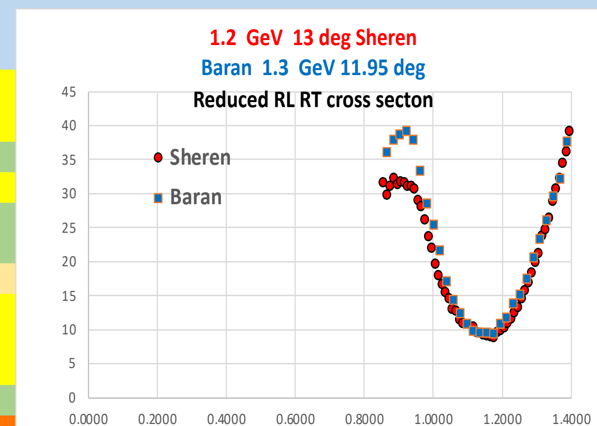
Q2=0.05 (0.039-0.060)

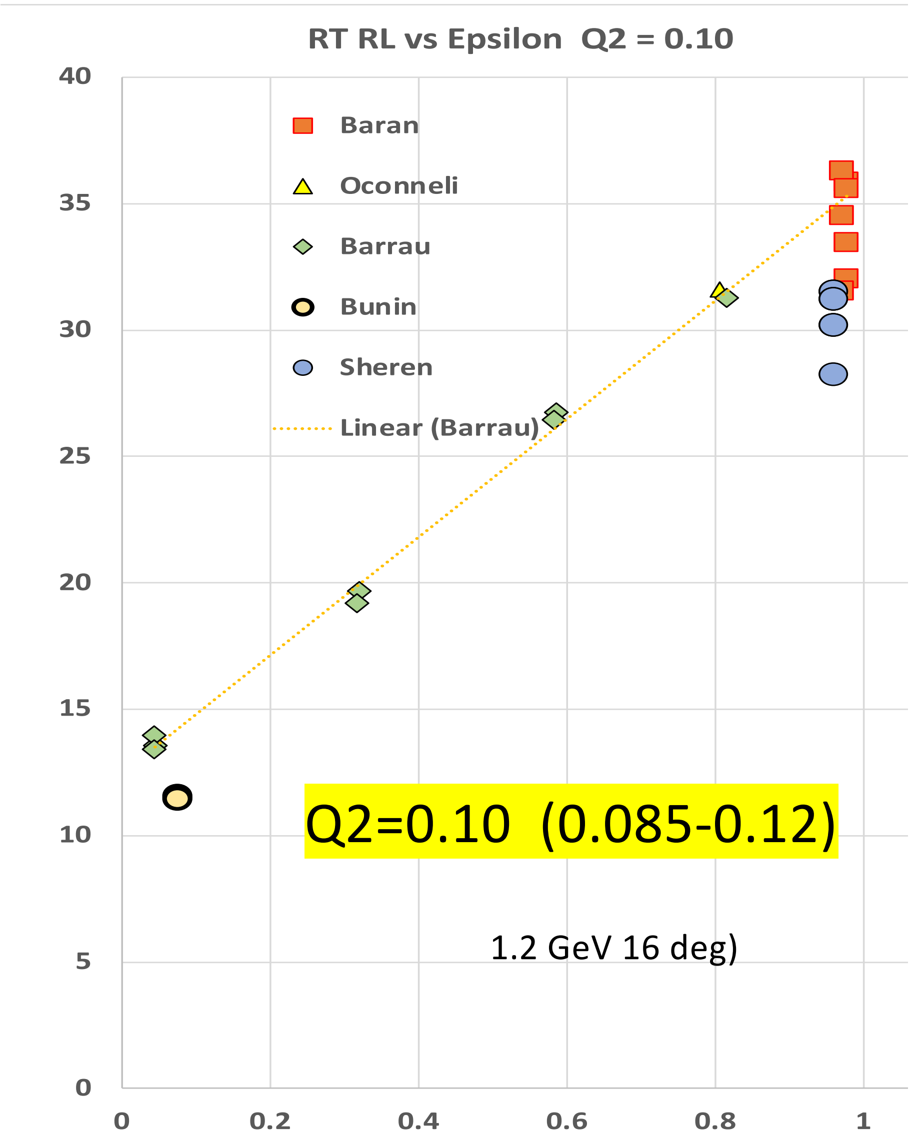


Data Set	E0	thetea	W2		Baran	Yama	Barrau	Bunin	Sheren	All	Q2		
18	0.1485	135	0.9200	Bunin				10.3341999		10.3341999	0.0509		
17	0.1506	180	0.9235	Ryan		8.78472754				8.78472754	0.0582		
1	0.24	60	0.9241	Barrow			27.7556447			27.7556447	0.0461	1 Barreau:1983ht	
18	0.1485	135	0.9245	Bunin				10.5719148		10.5719148	0.0499	2 O'Connell:1987ag	
12	1.2044	10.79	0.9250	Sheren					35.3762927		0.0492	# 3 Sealock:1989nx	
12	1.2044	10.79	0.9250	Sheren					35.3762927		0.0492	**4 Baran:1988tw**	
1	0.1999	90	0.9254	Barrow			20.9871137			20.9871137	0.0580	# 5 Bagdasaryan:1988hp	
1	0.4	36	0.9258	Barrow			36.5784435			36.5784435	0.0531	# 6 Dai - HallA:2019da	
17	0.1506	180	0.9280	Ryan		8.70635335				8.70635335	0.0571	# 7 Arrington:1995hs	
1	0.1597	145	0.9281	Barrow			12.3919849			12.3919849	0.0596	8 Day:1993md	1
18	0.1485	135	0.9295	Bunin				10.9167023		10.9167023	0.0488	9 Arrington:1998psnoCC	
17	0.1506	180	0.9332	Ryan		8.6359647				8.6359647	0.0558	10 Gaskell:2008	1
18	0.1485	135	0.9338	Bunin				10.6861293		10.6861293	0.0479	11 Whitney:1974hr	
1	0.24	60	0.9347	Barrow			26.7495412			26.7495412	0.0449	12 AlsamiJan05	
12	1.2044	10.79	0.9350	Sheren					34.0411909		0.0489	13 VaheJun07	1
12	1.2044	10.79	0.9350	Sheren					34.0411909		0.0489	14 E139	0
1	0.4	36	0.9359	Barrow			35.2840329			35.2840329	0.0523	15 Fomin	0
1	0.1999	90	0.9368	Barrow			19.1734019			19.1734019	0.0560	16 Yamaguchi73	
18	0.1485	135	0.9383	Bunin				9.43657149		9.43657149	0.0469	17 Ryan84	
17	0.1506	180	0.9386	Ryan		8.33694384				8.33694384	0.0545	18 Bounin63	
1	0.1597	145	0.9404	Barrow			11.7112587			11.7112587	0.0567		
											0.0520		

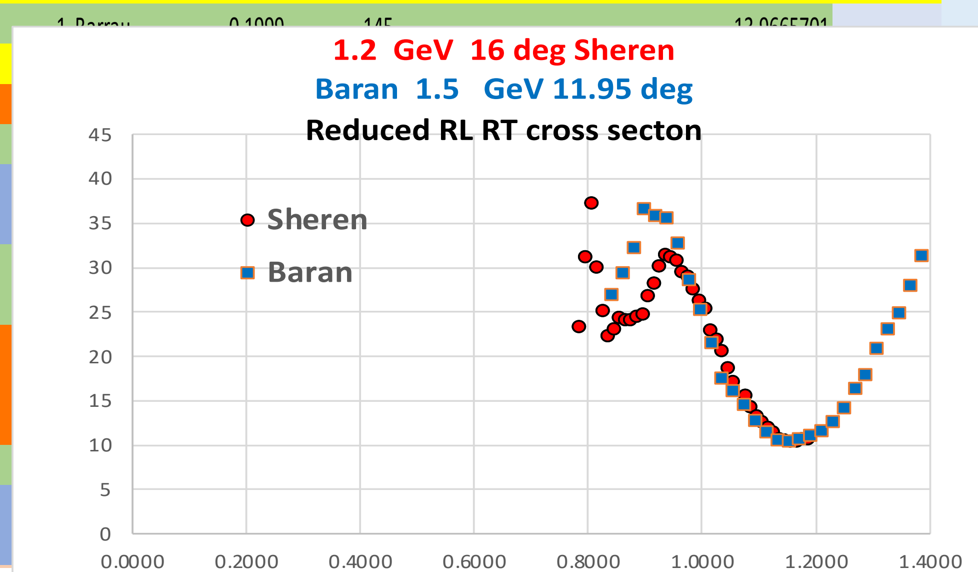


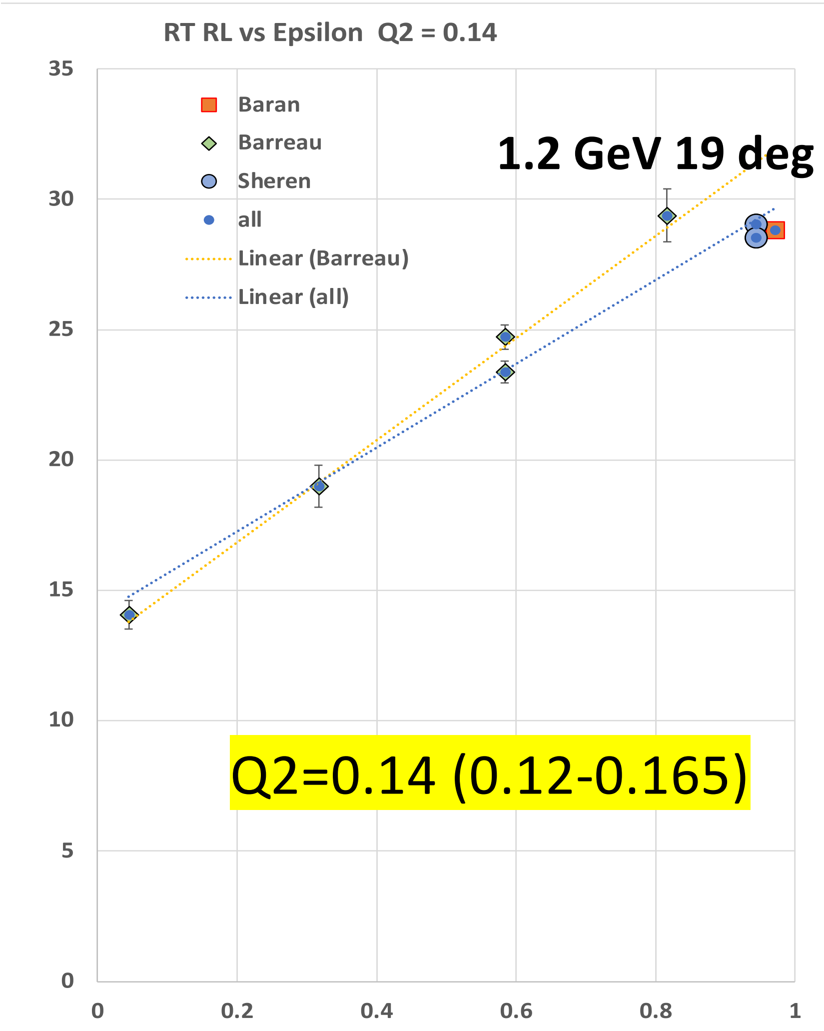
Data Set	E0	thetea	W2	
4	1.3	11.95	0.9231	Baran
16	0.25	80	0.9234	yamaguchu
16	0.25	80	0.9247	yamaguchu
12	1.2044	13.01	0.9251	Sheren
12	1.2044	13.01	0.9251	Sheren
16	0.25	80	0.9259	yamaguchu
1	0.2411	90	0.9259	Barrow
1	0.28	60	0.9266	Barrow
1	0.32	60	0.9269	Barrow
16	0.25	80	0.9273	yamaguchu
16	0.25	80	0.9286	yamaguchu
16	0.25	80	0.9298	yamaguchu
16	0.25	80	0.9305	yamaguchu
16	0.25	80	0.9312	yamaguchu
1	0.48	36	0.9314	Barrow
18	0.198	135	0.9318	Bunin
16	0.25	80	0.9325	yamaguchu
16	0.25	80	0.9337	yamaguchu
				chu
				chu
				chu
				chu
				chu
				chu
4	1.3	11.95	0.9424	Baran



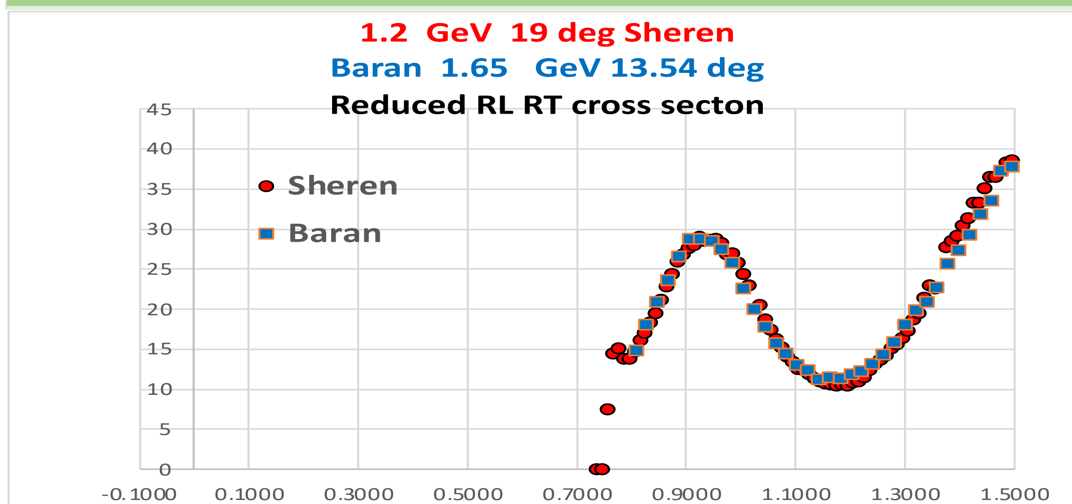


Data Set	E0	E0	theta	Baran	Oconnel	Barraau	Bunin	Sheren
12	E40=001	1.2044	16.01					28.2539147
1	Barrau	0.1999	145			13.5824045		
4	Baran	1.65	11.95	32.0378975				
18	Bunin	0.198	135				11.5698869	
4	Baran	1.5	11.95	35.8743104				
4	Baran	1.3	13.54	36.3293043				
1	Barrau	0.2801	90			19.6796789		
12	E40=001	1.2044	16.01					30.2141971
12	E40=001	1.2044	16.01					30.2141971
1	Barrau	0.361	60			26.7539855		
18	Bunin	0.198	135				11.4563105	

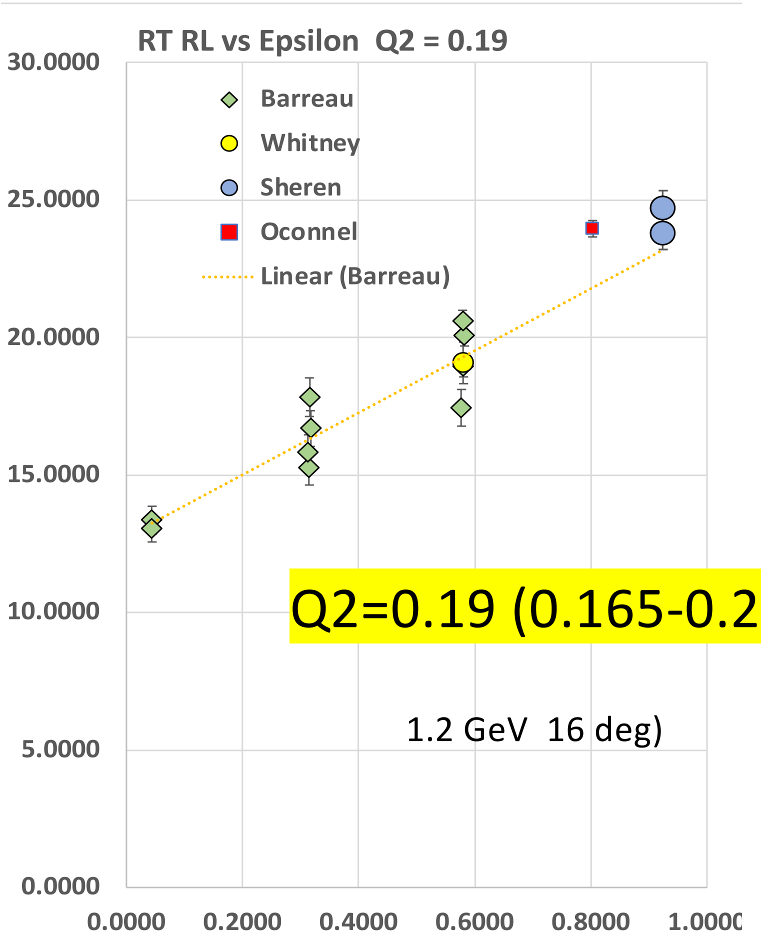




1	Barreau	0.44	60		23.3689631		23.3689631
12	Sheren	1.2044	19.01			29.0478906	29.0478906
12	Sheren	1.2044	19.01			29.0478906	29.0478906
4	Baran	1.65	13.54	28.8192511			28.8192511
1	Barreau	0.2411	145		14.0614737		14.0614737
1	Barreau	0.62	36		29.3858785		29.3858785
1	Barreau	0.401	60		24.7214919		24.7214919
12	Sheren	1.2044	19.01			28.5307867	28.5307867
12	Sheren	1.2044	19.01			28.5307867	28.5307867
1	Barreau	0.3201	90		18.9924457		18.9924457

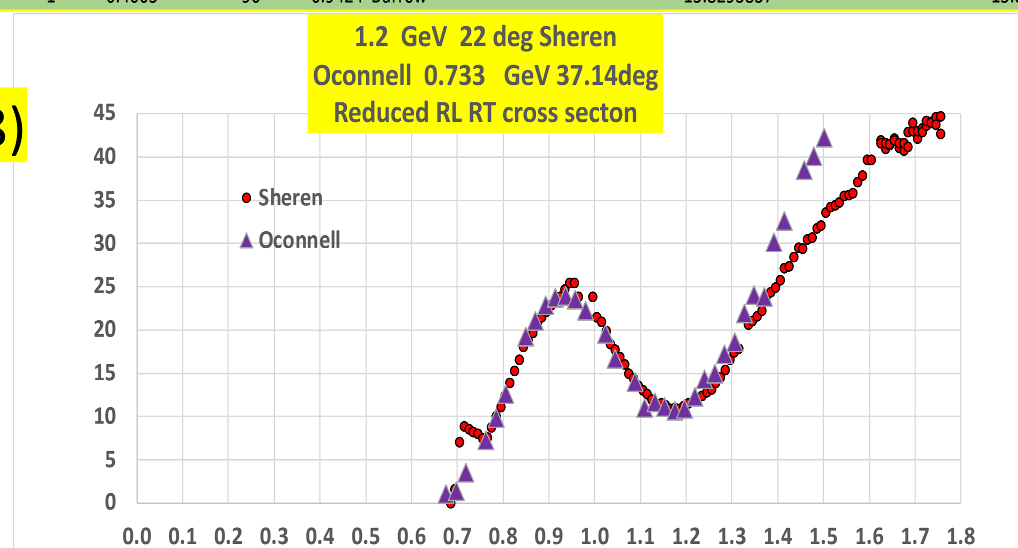


1	0.3601	90.0000	0.9199	Barrow			16.6954		16.6954
1	0.2801	145.0000	0.9210	Barrow			13.3646		13.3646
12	1.2044	22.01	0.9250	Sheren				23.7914947	
12	1.2044	22.01	0.9250	Sheren				23.7914947	
1	0.519	60	0.9255	Barrow			18.9400229		18.9400229
1	0.48	60	0.9264	Barrow			20.0801038		20.0801038
11	0.5	60	0.9277	Whitney	19.0833109				19.0833109
1	0.4005	90	0.9291	Barrow			15.2627619		15.2627619
1	0.3601	90	0.9329	Barrow			17.8397366		17.8397366
1	0.3201	145	0.9336	Barrow			13.0456411		13.0456411
12	1.2044	22.01	0.9351	Sheren				24.7257143	
12	1.2044	22.01	0.9351	Sheren				24.7257143	
2	0.73	37.1	0.9361	Occonel		23.9589938			23.9589938
1	0.48	60	0.9382	Barrow			20.5973938		20.5973938
1	0.56	60	0.9383	Barrow			17.4590593		17.4590593
1	0.4005	90	0.9424	Barrow			15.8293837		15.8293837

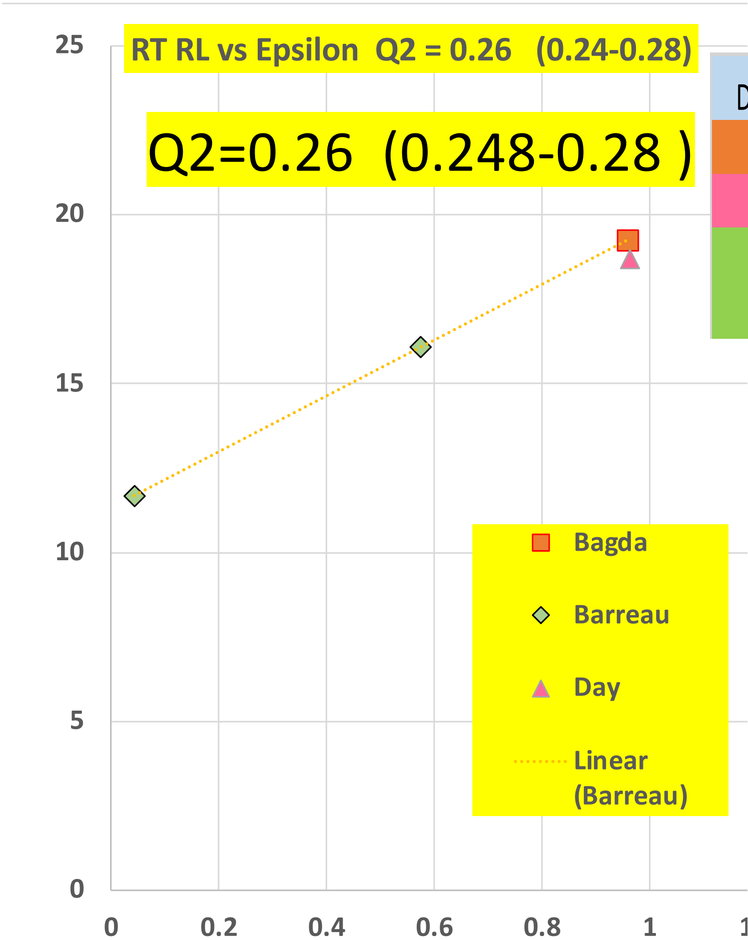


Q2=0.19 (0.165-0.248)

1.2 GeV 16 deg)

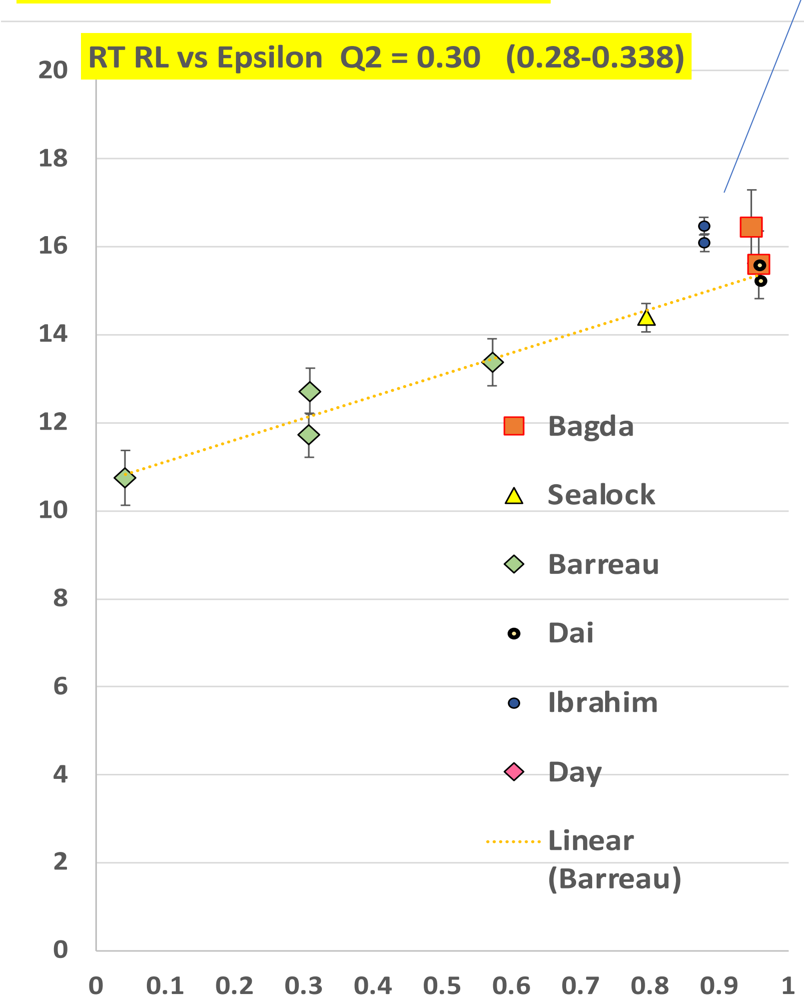


No **E04-001** data



Data Set	E0	thetea	W2		Bagda	Barraau	Day	Q2
5	1.93	16	0.9240	Bagda	19.2441212			0.26406972
8	2.02	15.022	0.9339	Day			18.6900345	0.25610398
1	0.3601	145	0.9347	Barrow		11.6815923		0.2555
1	0.62	60	0.9391	Barrow		16.0729106		0.2744

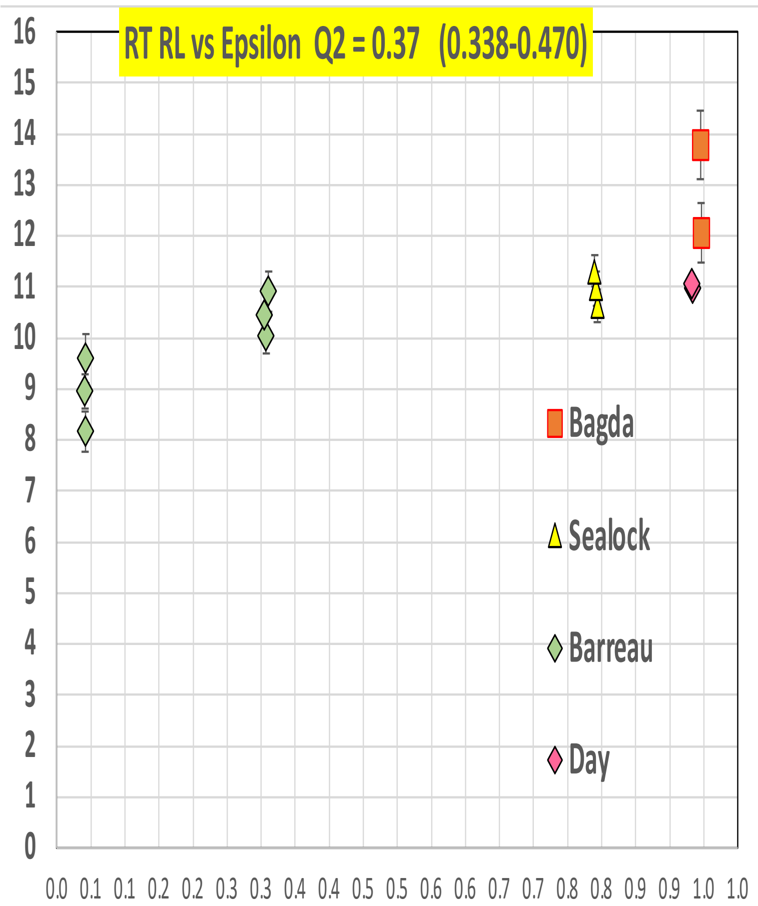
Q2=0.30 (0.28-0.338)



1.2 GeV 28 degrees

Data Set	E0	thetea	W2		Dai	Bagda	Barraau	Sealock	Ibrahim	All	Q2
6	2.222	15.541	0.9210	Dai	15.2270181					15.2270181	0.32901632
1	0.68	60	0.9229	Barrow			13.3716415			13.3716415	0.3281
13	1.2044	28.01	0.9248	Ibrahim					16.0988026		0.28960209
5	1.93	18	0.9288	Bagda		16.4577274				16.4577274	0.3268348
1	0.5193	90	0.9293	Barrow			11.7234286			11.7234286	0.3298
1	0.3997	145	0.9309	Barrow			10.7500105			10.7500105	0.3054
13	1.2044	28.01	0.9334	Ibrahhim					16.4654514		0.28847348
1	0.3601	145	0.9347	Barrow							
5	2.13	16	0.9351	Bagda		15.5931875				15.5931875	0.31866361
1	0.4794	90	0.9365	Barrow			12.7214576			12.7214576	0.2852
3	0.961	37.5	0.9375	Sealock				14.4010197		14.4010197	0.30503031
6	2.222	15.541	0.9414	Dai	15.5862817					15.5862817	0.32739155

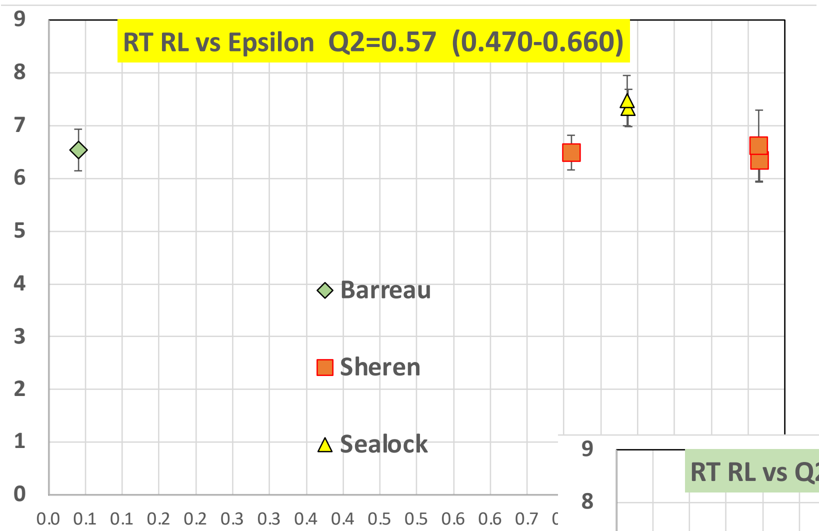
Q2=0.37 (0.338-0.470) no E04-001 data



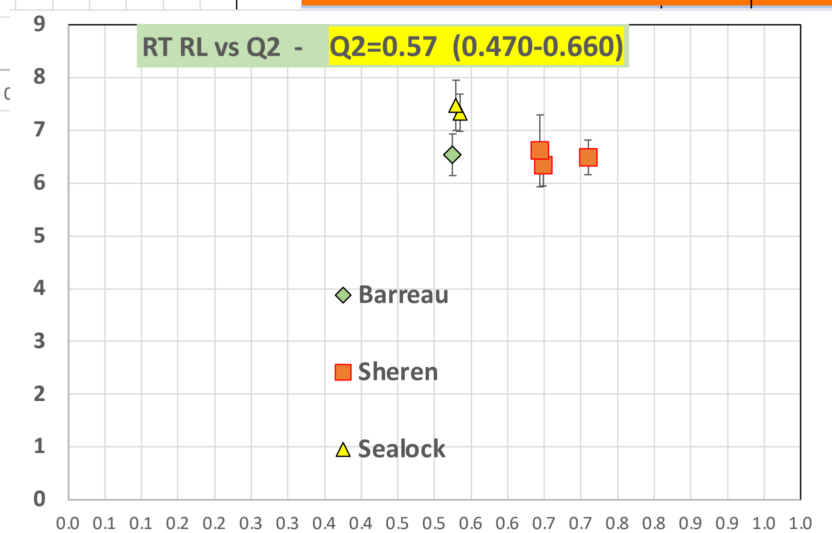
		W2		Sealock	Bagda	Barreau	Day	Q2
1	0.5193	90.0000	0.9001 Barrow			10.9187		0.3401
3	1.1080	37.5000	0.9029 Sealock	10.6336				0.4034
5	2.1300	18.0000	0.9137 Bagda		12.0526212			0.3964
1	0.5568	90.0000	0.9160 Barrow			10.0441		0.3758
1	0.4794	145.0000	0.9200 Barrow			8.1767		0.4142
3	1.1080	37.5000	0.9262 Sealock	10.9752				0.3989
8	2.02	20.016	0.9282 Day				10.9761096	0.4307
1	0.4400	145.0000	0.9323 Barrow			9.5982		0.3562
1	0.5568	90.0000	0.9459 Barrow			10.4709		0.3647
5	2.1300	18.0000	0.9492 Bagda		13.7917			0.3928
3	1.1080	37.5000	0.9496 Sealock	11.3199				0.3943
1	0.4794	145.0000	0.9562 Barrow			8.9659		0.3968
8	2.02	20.016	0.9600 Day				11.0591519	0.4270

Q2=0.57 (0.470-0.660)

1.2 GeV 45 deg,   3.49 GeV 14 deg
Q2 Bin centering is not so large



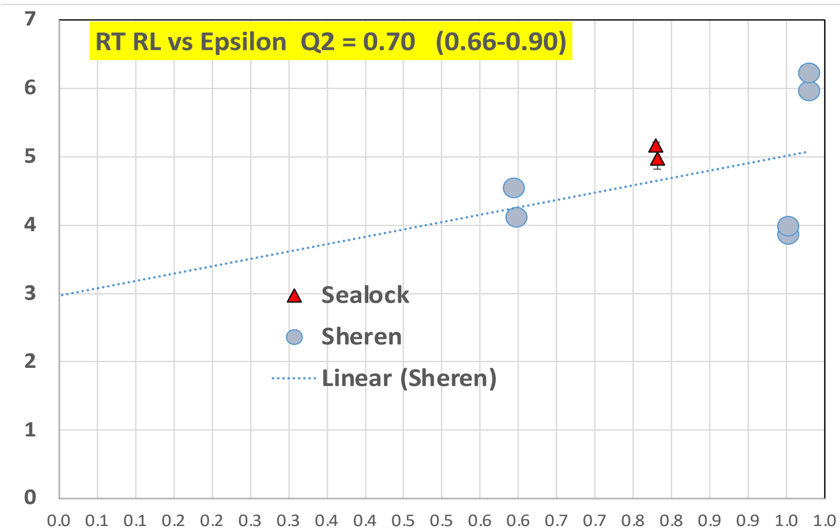
E0		theta	W2			Sheren	Barreau	Sealock	Q2	all
12	3.4886	14.0000	0.9100	Sheren		6.3367			0.6482	6.3367
12	1.2044	45.0000	0.9101	Sheren		6.4865			0.7100	6.4865
3	1.2990	37.5000	0.9142	Sealock				7.3318	0.5347	7.3318
1	0.5600	145.0000	0.9234	Barrow			6.5376		0.5246	6.5376
3	1.2990	37.5000	0.9384	Sealock				7.4777	0.5294	7.4777

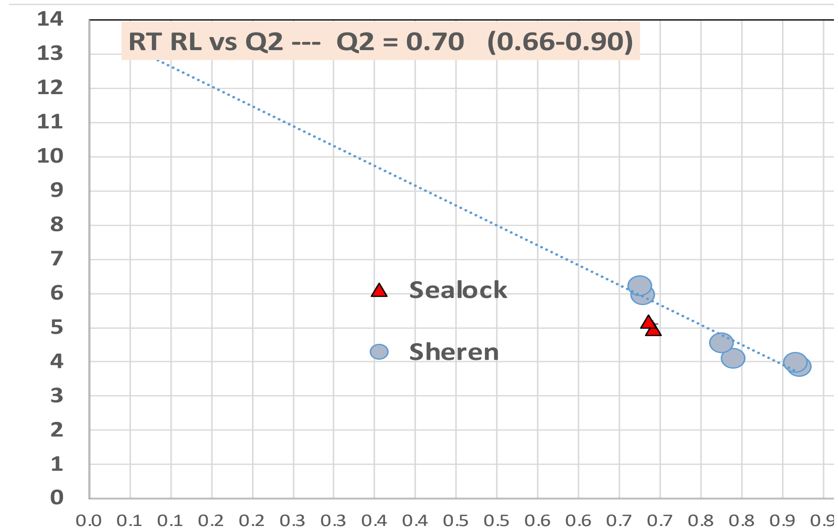


Q2=0.75 (0.66-0.90)

Q2 =0.75 (0.660-0.90) **4.63 GeV 10.65 deg**, **1.2 GeV 55 degn**

HERER Q2 bin centering important





	E0	theta	W2			Sheren	Barreau	Sealock	Q2	all
12	4.6286	10.6500	0.9101	Sheren		5.9588			0.6779	5.9588
12	1.2044	55.0000	0.9101	Sheren		4.1112			0.7890	4.1112
12	3.5950	16.0200	0.9113	Sheren		3.8612			0.8698	3.8612
3	1.5010	37.5000	0.9130	Sealock				4.9704	0.6917	4.9704
3	1.5010	37.5000	0.9380	Sealock				5.1703	0.6855	5.1703
12	3.5950	16.0200	0.9437	Sheren		3.9793			0.8656	3.9793
12	1.2044	55.0000	0.9499	Sheren		4.5475			0.7749	4.5475
12	4.6286	10.6500	0.9500	Sheren		6.2309			0.6748	6.2309
12	1.5010	37.5000	0.9629	Sheren		5.3269			0.6793	5.3269
12	3.5950	16.0200	0.9760	Sheren		4.2318			0.8614	4.2318

Q2=1.1   (0.90-1.4)

Q2 =1.0 (0.90-0.1.2)   **3.49 GeV 20 deg**, **1.2 GeV 70 deg,**   **2.35 GeV 30 deg**
HERER Q2 bin centering important

the eye.

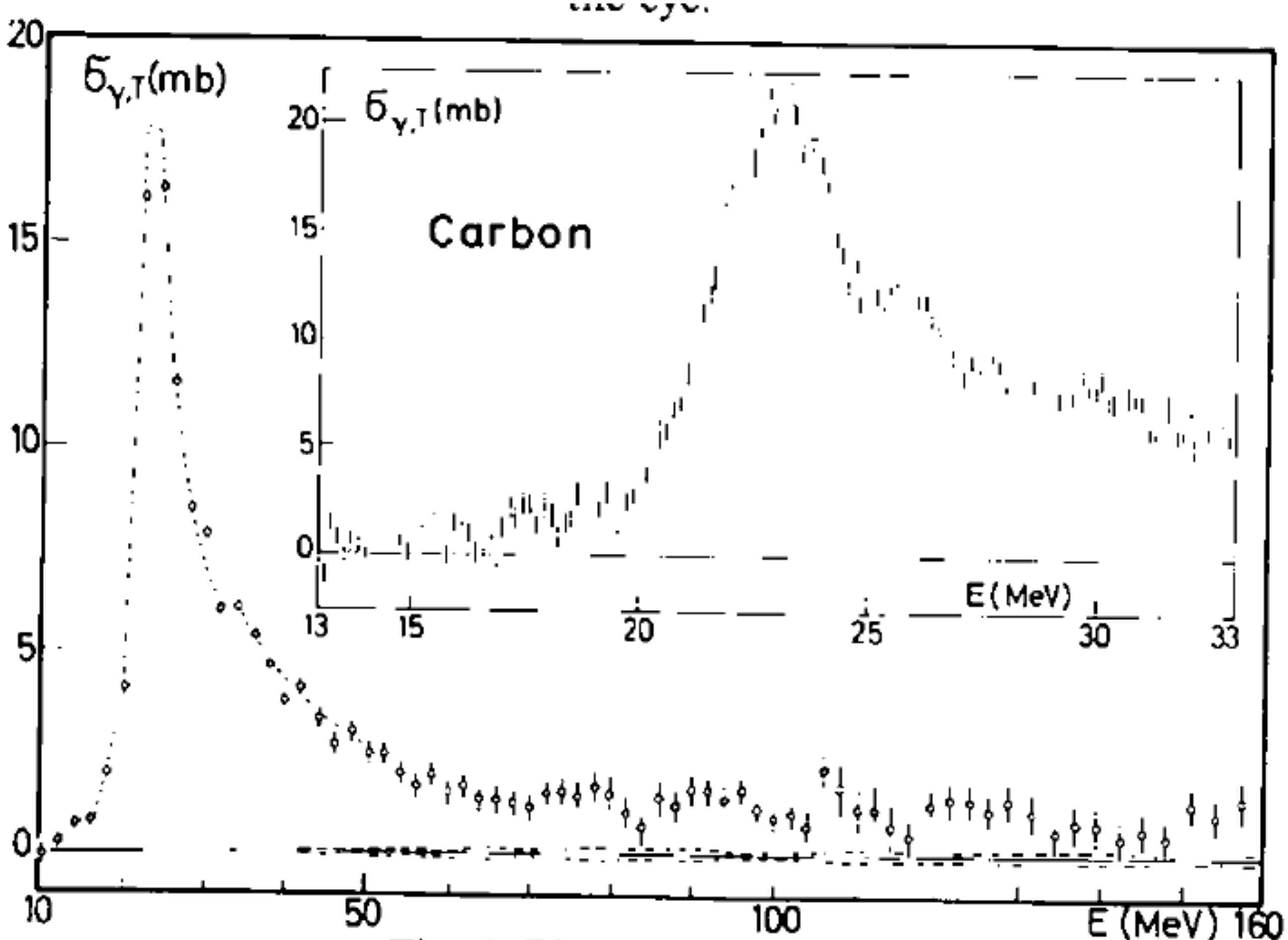
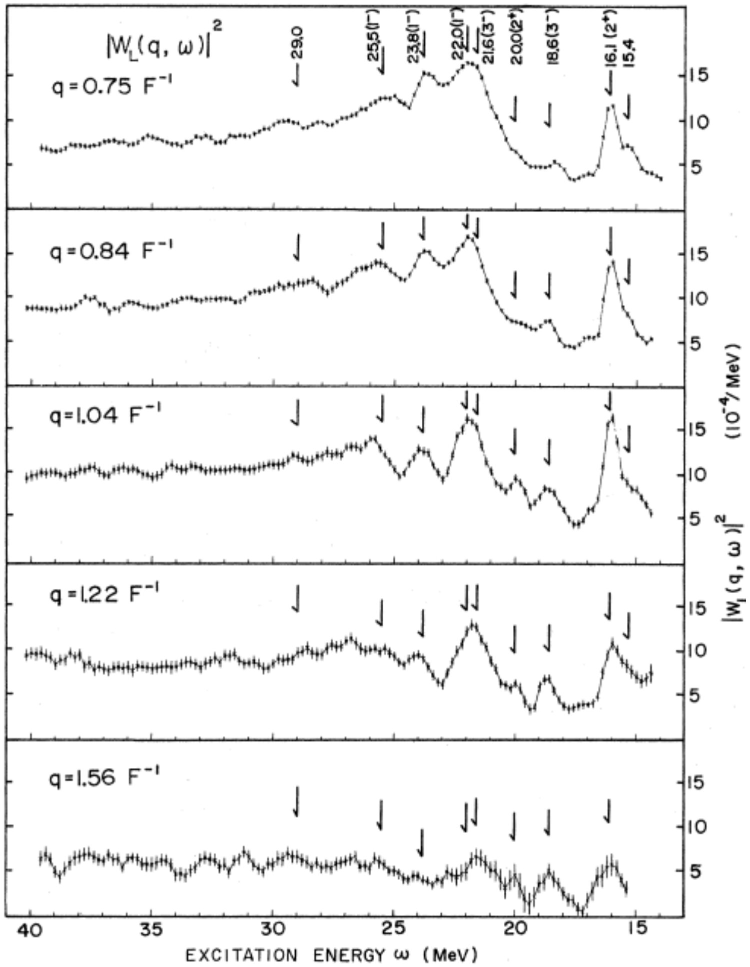
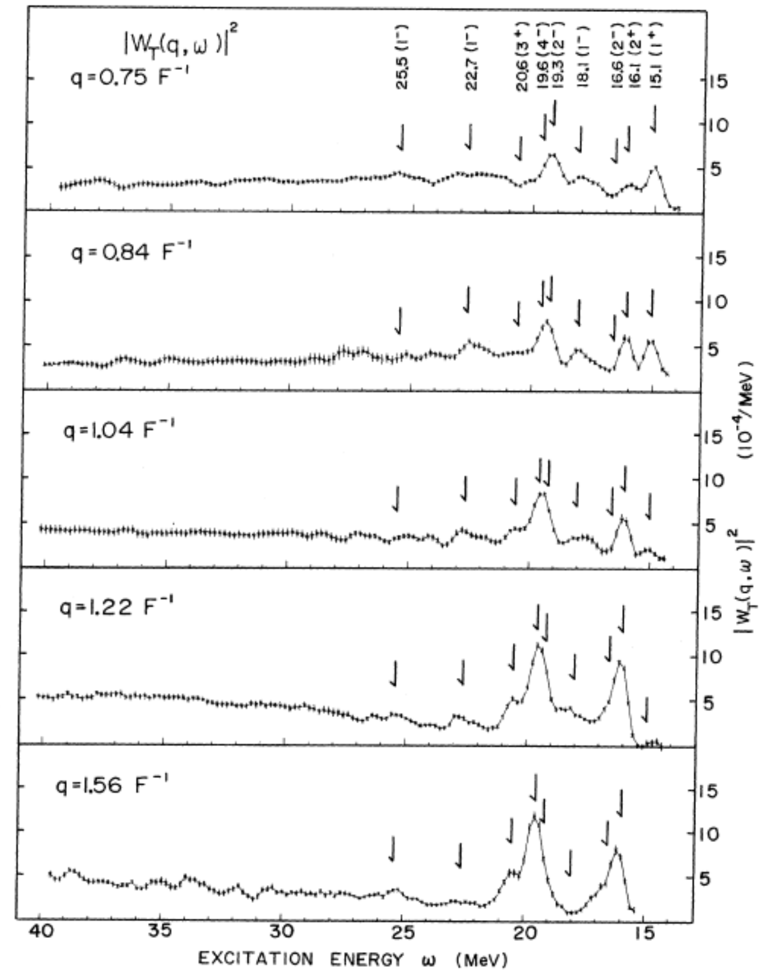
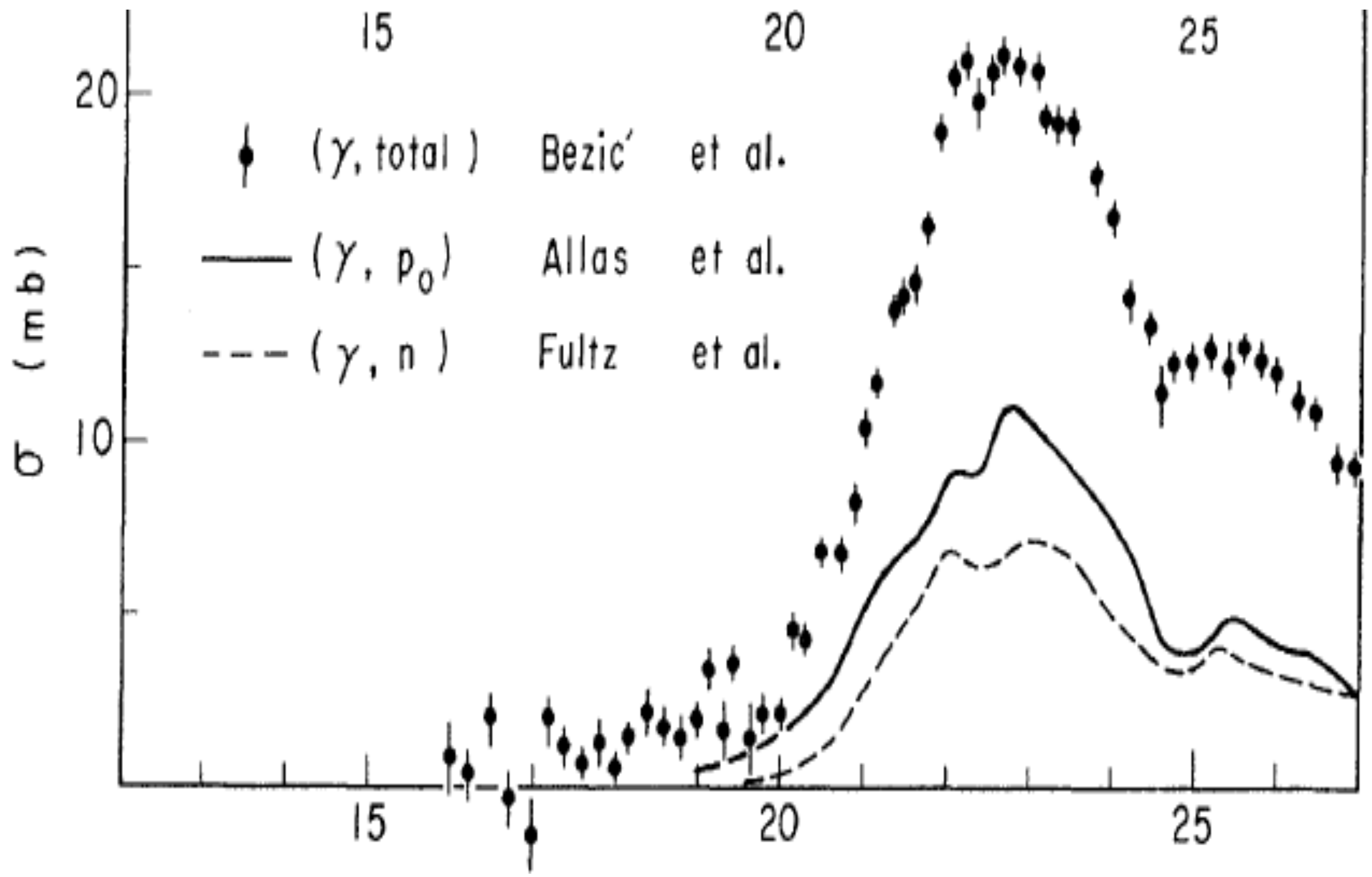


Fig. 4. The same as fig. 2 for C.


$|W_L(q,\omega)|^2$
29.0
25.5(1⁻)
23.8(1⁻)
22.0(1⁻)
21.6(3⁻)
20.0(2⁺)
18.6(3⁻)
16.1 (2⁺)
15.4
q = 0.75 F⁻¹
q = 0.84 F⁻¹
q = 1.04 F⁻¹
q = 1.22 F⁻¹
q = 1.56 F⁻¹
$|W_L(q,\omega)|^2$ (10⁻⁴/MeV)
EXCITATION ENERGY ω (MeV)


$|W_T(q,\omega)|^2$
25.5 (1⁻)
22.7 (1⁻)
20.6 (3⁺)
19.6 (4⁻)
19.3 (2⁻)
18.1 (1⁻)
16.6 (2⁻)
16.1 (2⁺)
15.1 (1⁺)
q = 0.75 F⁻¹
q = 0.84 F⁻¹
q = 1.04 F⁻¹
q = 1.22 F⁻¹
q = 1.56 F⁻¹
$|W_T(q,\omega)|^2$ (10⁻⁴/MeV)
EXCITATION ENERGY ω (MeV)

ward and backward), keeping the momentum transfer constant. The forward-angle cross sections corresponding to q values of 0.75, 0.84, 1.04, 1.22, and 1.56 F^{-1} were taken at angles of 35, 40, 50, 60, and 80° with an incident electron of 250 MeV, and the backward-angle data were taken at 135° by adjusting the incident electron energy to give the same momentum transfer as above. In our kinematical calculation, q was obtained by assuming an excitation energy of 25 MeV. The values of q were corrected for the change of wavelength of the incident electron when it passes through the nucleus. This correction factor is $\gamma = (1 + 3Z\alpha/2k_1R)$,[46] where α is the fine-structure constant and R is the equivalent uniform-nuclear-charge radius. Then, incident electron energies in the backward-angle experiments were selected so that $q'(250\ \text{MeV}, \theta) = q'(\epsilon_1, 135°)$, where $q' = \gamma q$.



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20
25
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σ (mb)
(γ, total) Bezic' et al.
(γ, p0) Allas et al.
(γ, n) Fultz et al.
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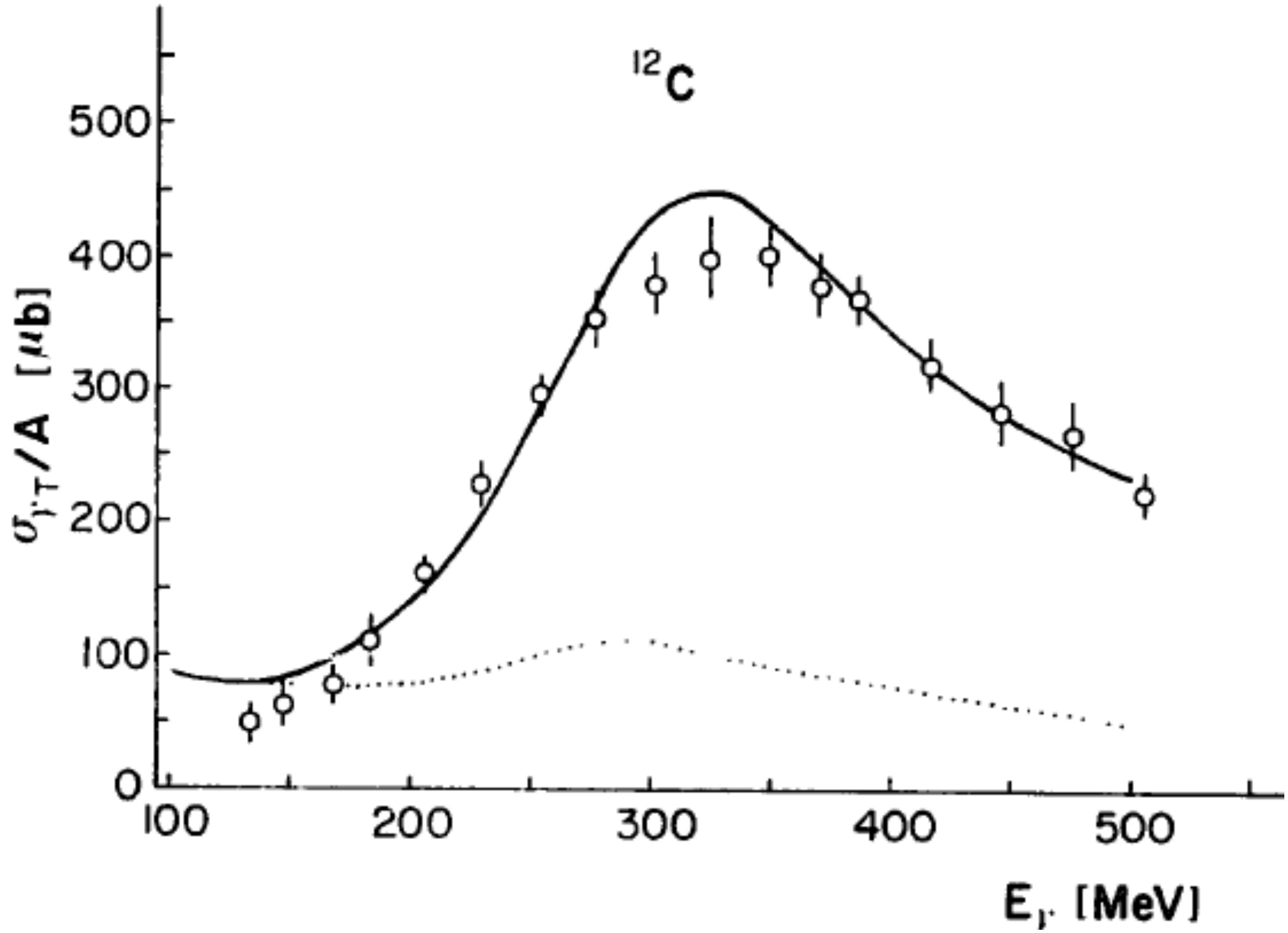

^{12}C
$\sigma_{\gamma T}/A$ [μb]
0
100
200
300
400
500
100
200
300
400
500
E_{γ} [MeV]

k [GeV]	^{7}Li [μb/A]	C [μb/A]	Al [μb/A]	Cu [μb/A]	Sn [μb/A]	Pb [μb/A]	Average [μb/A]
0.301		420±10	397±13	375±16	398±19	387±21	401.5±6.5
0.317		430±7	412±9	430±12	419±14	381±15	419.5±4.6
0.343	440±15	432±6	416±8	403±10	417±11	415±12	421.2±3.6
0.369	389±10	406±6	414±8	413±13	413±10	410±12	407.1±3.6
0.389	351±12	393±6	376±8	376±9	399±11	389±10	383.6±3.4
0.408	324±13	362±7	353±9	358±12	378±13	329±14	354.7±4.1
0.439	282±9	324±6	323±7	317±9	328±10	337±15	317.8±3.3
0.465	257±13	287±5	288±7	294±9	322±10	319±12	292.0±3.2
0.490	244±12	251±5	255±7	252±8	250±9	257±11	251.6±3.2
0.514	223±12	254±4	251±5	247±6	241±8	273±9	250.9±2.5
0.540	194±7	235±3	243±4	236±5	245±6	249±7	235.7±2.0
0.568		216±6	222±7	219±9	228±11	240±13	221.1±3.6
0.598	222±11	218±6	227±7	212±9	222±10	210±12	218.8±3.4
0.616	211±6	200±5	202±6	197±8	210±9	197±8	202.6±2.7
0.636	196±6	210±4	211±5	201±6	203±7	192±8	204.2±2.3
0.664	213±7	207±4	213±5	198±7	207±7	191±7	206.4±2.2
0.684	205±7	190±6	201±8	192±7	181±10	174±9	192.4±3.0
0.717	206±8	185±5	201±6	186±7	171±9	173±9	188.4±2.7
0.751	194±9	181±7	190±9	175±10	207±9	159±12	186.0±3.6
0.768		195±5	191±6	179±8	178±13	187±12	189.8±3.2
0.788	166±7	184±7	183±9	174±12	173±13	173±12	176.3±3.6
0.817	180±9	183±7	185±9	163±12	187±14	178±12	180.3±3.9
0.840	194±8	187±5	178±6	179±8	180±10	182±11	183.7±3.0
0.865		181±8	180±10	172±12	179±16	218±21	181.1±4.9
0.895		182±7	192±10	164±12	169±15	195±14	181.3±4.7
0.908	169±8	162±7	174±9	169±13	182±12	167±15	169.1±3.9
0.936	137±7	166±5	171±7	160±10	162±13	168±12	160.3±3.2
0.973	171±8	178±7	161±9	157±12	151±13	171±12	168.2±3.8
1.044	145±9	167±7	155±9	164±13	158±15	151±14	157.2±4.1
1.081	165±10	147±7	147±10	148±15	148±17	147±15	150.9±4.4
1.119	147±8	156±7	150±10	143±14	154±16	163±15	151.6±4.1
1.163	140±12	144±10	144±13	145±20	120±22	135±20	140.7±5.7

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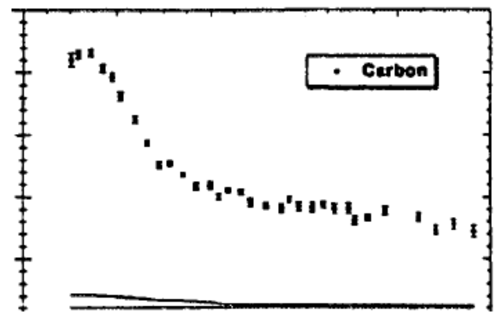
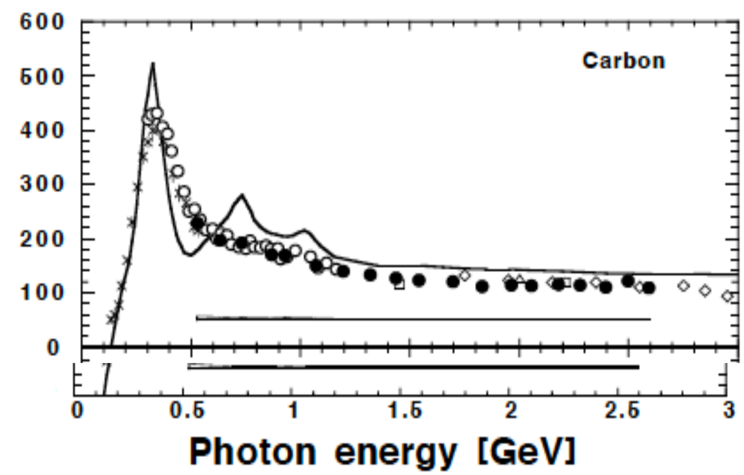


LNF-95/053 (P)
28 Settembre 1995

Total Hadronic Photoabsorption Cross Section on Nuclei in the Nucleon Resonance Region

N. Bianchi, V. Muccifora, E. De Sanctis, A. Fantoni, P. Levi Sandri, E. Polli, A.R. Reolon, P. Rossi



Photoabsorption on nuclei in the shadowing threshold region.

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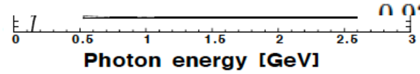
May 6, 2019



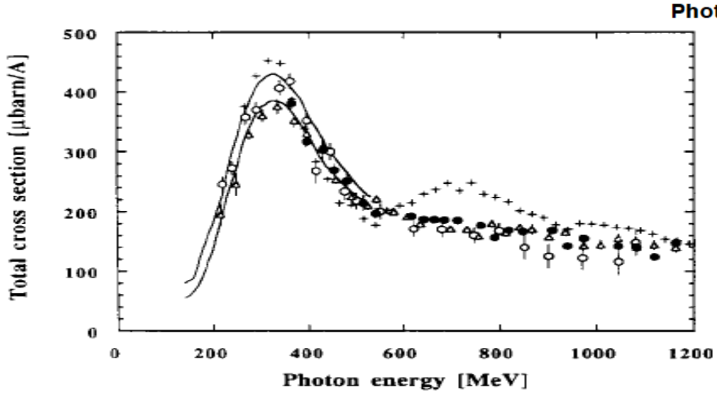
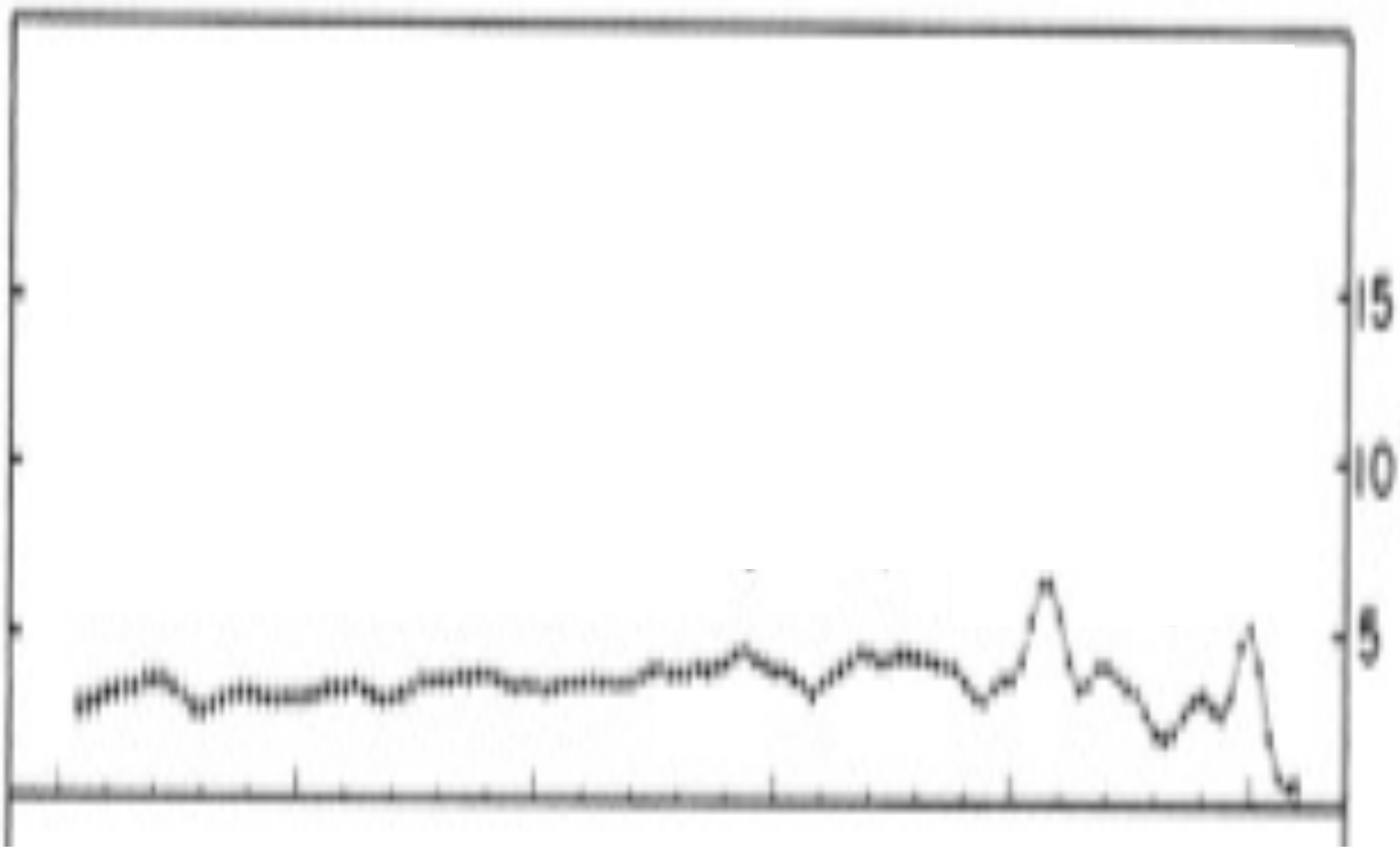


Fig. 2 Comparison of the present results of $\sigma_{\gamma A}/A$ for C (full circles) with previous data on ^{238}U (open triangles) [9] and C (open circles) [10], with the Daresbury deuteron data (crosses) [5] and with the universal behavior in the Δ region (area between the two curves) calculated from data on Be [15,16], C [17] and

Table 3: Total cross sections [μb] and statistical error normalized to the mass number A at the photon energy [GeV]. The average value $\overline{A}$ is calculated weighting eac nucleus cross section value with its statistical error.

	Total cross section /A					
k	C	Al	Cu	Sn	Pb	$\overline{A}$
0.53	229±3	240±3	244±4	256±4	271±4	243±2
0.63	197±3	211±3	208±4	215±4	213±5	207±2
0.73	192±1	195±2	195±3	199±2	180±3	193±1
0.87	170±1	170±2	176±2	174±3	160±3	171±1
0.93	169±2	161±3	169±2	171±3	154±3	167±1
[illegible]	150±1	148±2	153±2	152±2	142±2	150±1
1.19	139±2	134±3	142±3	145±3	134±3	139±1
1.32	134±1	132±2	136±2	136±3	133±3	134±1
1.43	126±2	126±3	134±4	137±5	133±5	129±2
1.54	123±1	125±2	134±2	134±3	132±3	127±1
1.70	121±2	120±3	126±3	118±4	130±4	122±1
1.83	112±2	121±3	122±3	119±4	122±4	117±1
1.96	114±2	112±3	118±4	116±4	119±5	115±1
2.06	114±3	121±5	112±5	116±6	110±6	115±2
2.18	116±4	110±5	114±5	122±6	119±7	116±2
2.28	114±4	100±6	115±6	108±7	107±8	110±3
2.39	111±4	98 ±5	107±6	101±7	109±8	106±2
2.50	122±5	102±7	117±7	112±8	122±9	116±3
2.59	109±5	112±7	101±7	118±9	124±10	111±3



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