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NUCLEAR STRUCTURE FACTORS FOR TWO-PARTICLE REACTIONS IN 1P-SHELL NUCLEI

O. Dragún, E. Maqueda, J. Testoni

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O.Dragún, E.Maqueda[+], J.Testoni[+]
Comisión Nacional de Energía Atómica
Buenos Aires, Argentina

ABSTRACT

The structure factors for two-particle transfer in the 1p-shell are calculated. An example of DWBA calculations using a single-nucleon code is presented. The results for different shell model descriptions are compared.

[+] Fellow of the Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina.

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1. INTRODUCTION

For the natural parity states in the p-shell nuclei, simple shell model descriptions can be obtained which give good account of the energy levels. The corresponding wave functions have been used to get spectroscopic factors for one-particle transfer reactions [1] and they have been found to be in satisfactory agreement with the experiments [2].

In a similar way we have obtained two-particle nuclear structure factors, which can be readily introduced in DWBA calculations using the well known single nucleon codes.

We give first the formulae and then we present a table with the results for all stable targets in the region. In each case we have chosen those wave functions which give the best energy fit, but some results for other shell model descriptions of the states are also shown for the sake of comparisson.

The computer programme can be applied to calculate any other two-particle transfer between p-shell states and used with any other set of wave functions.

We finnaly indicate by means of an example the way to obtain angular distributions with a DWBA code. The results are compared with the corresponding experimental data.

2. THE TWO-PARTICLE STRUCTURE FACTORS

In this section we follow closely the method outlined by Glendenning in ref. [3].

The differential cross-section for a two-particle stripping reaction which leads from a state $|\alpha_1 J_1 T_1 M_{T_1}\rangle$ of the nucleus with A nucleons to a final $|\alpha_2 J_2 T_2 M_{T_2}\rangle$ state in the (A+2) nucleus is given by

$$\frac{d\sigma}{d\Omega} = \frac{m_a m_b}{(2\pi\hbar^2)^2} \frac{k_b}{k_a} \frac{2J_2+1}{2J_1+1} \Omega_b^2$$

$$\times \sum_{TSLJ} \langle T_1 T M_{T_1} (M_{T_2}-M_{T_1}) | T_2 M_{T_2} \rangle^2 \qquad (1)$$

$$\times \sum_M \left| \sum_N b_{ST} \, G_{NLSJT}(\alpha_1 J_1 T_1, \alpha_2 J_2 T_2) \, B_{NL}^M(\underline{k}_a, \underline{k}_b) \right|^2$$

where the subscripts a and b refer to the incoming and outgoing light nuclei respectively. The overlap between the outgoing particle and its corresponding piece in the incident particle is indicated by Ω_b. The summation runs over the quantum numbers of the transferred pair. The factor b_{ST} is a geometrical coefficient referring to the spin and charge exchanged in the reaction. The DWBA code takes care of the kinematical factor B_{NL}^M. The structure factor in the 1p-shell is

$$G_{NLSJT} = \sqrt{2}\, \Omega_n \langle n0, NL, L | 11, 11, L \rangle \langle \alpha_2 J_2 T_2 \{ | \alpha_1 J_1 T_1, TSLJ \rangle \qquad (2)$$

In the above formula which includes an harmonic oscillator transformation bracket [4] $\langle n\ell, NL, \lambda \,|\, n_1\ell_1, n_2\ell_2, \lambda\rangle$ we make the usual s-state (ℓ=o) approximation for the relative motion in the light projectile. The overlap between the wave functions describing the relative motion of the transferred particles in the light incident and heavy residual nuclei is denoted by Ω_n.

In order to obtain expressions for the fractional parentage coefficients $\langle \alpha_2 J_2 T_2 \{| \alpha_1 J_1 T_1, TSLJ\rangle$ we note that in an intermediate coupling scheme a state can be expanded in terms of L-S coupled wave functions as

$$|\alpha J T\rangle = \sum_{f\rho S\varkappa L} A^{\alpha JT}_{[f]\rho TS\varkappa L} \,|[f]\rho TS\varkappa L J\rangle \tag{3}$$

so that it is possible to write

$$\langle \alpha_2 J_2 T_2 \{| \alpha_1 J_1 T_1, TSLJ\rangle =$$

$$\left[\tfrac{1}{2}(A-2)(A-3)\right]^{1/2} \sum_{\substack{f_2\rho_2 S_2\varkappa_2 L_2 \\ f_1\rho_1 S_1\varkappa_1 L_1}} \begin{bmatrix} L_1 & S_1 & J_1 \\ L & S & J \\ L_2 & S_2 & J_2 \end{bmatrix}$$

$$\times \left(\frac{n_{[f_2]}}{n_{[f_1]}}\right)^{1/2} C^{\widetilde{[f_2]}\rho_2 T_2 S_2}_{\widetilde{[f_1]}\rho_1 T_1 S_1, TS} \; C^{[f_2]\varkappa_2 L_2}_{[f_1]\varkappa_1 L_1, L} \tag{4}$$

$$\times A^{\alpha_2 J_2 T_2}_{[f_2]\rho_2 T_2 S_2 \varkappa_2 L_2} \; A^{\alpha_1 J_1 T_1}_{[f_1]\rho_1 T_1 S_1 \varkappa_1 L_1}$$

where we have used the weight, charge-spin and orbital two-particle fractional parentage coefficients of the L-S coupling as given in ref. [5].

Although for simplicity the formulation has been displayed for a stripping reaction, the expressions (2) and (4) remain unchanged in the pick up case provided one interchanges the roles of the initial and final states.

3. RESULTS

The intermediate coupling coefficients $A^{\alpha J T}_{[f]\xi T S n L}$ were obtained from a calculation [6] in which the effective interactions of Cohen and Kurath [7] were used. We get the results of table 1 for stripping in A=6 and 7 and pick up in A=7, 9 and 10 with the 2BME-wave functions (in the notation of ref. [7]) and with states corresponding to POT for all other reactions and targets.

In the calculation of Ω_n the harmonic oscillator length parameter ν was obtained from

$$\nu = (1.36\, A^{-1/3} - 0.040\, A^{2/3})\, F^{-2} \qquad (5)$$

This expressions follows from the typical $A^{-1/3}$ dependence of the oscillator gap and the interpolation between the two extremes of the p-shell.

The table 1 has been ordered according to the target mass numbers and the type of reaction. In each case we give the fractional parentage coefficients (FPC) and the product $b_{ST} \cdot G_{NLSJT}$ for the five most common two-particle transfer reactions leading to the lowest energy levels in the corresponding nucleus. Those cases in which the structure factors are less than 0.001 have been excluded.
Different final states with the same JF and TF are labelled by the intermediate coupling energies (E). Bellow each theoretical energy we list the experimental values [8-11], if they are known, with the indication of the nucleide to which they correspond. When either the spin-parity or the model identification of the state are in doubt, the experimental energies appear between parenthesis. To complete the labels of the structure factors the next column gives the quantum numbers L, S, J, T and N.
In order to use the structure factors listed in table 1 and a single-particle DWBA code in two-particle transfer reaction calculations, it is necessary to introduce a modification in the subroutines which give the form factor $u_{NL}(r)$, so as to produce the coherent sum over the centre of mass radial quantum number

$$u_L = \sum_N G_{NLSJT}\, u_{NL} \qquad (6)$$

4. DISCUSSION

As an example, in fig. 1 we compare absolute angular distributions[12] for the reaction (^{3}He,p) leading to several levels of ^{14}N, with theoretical predictions obtained using the above indicated method. The intermediate coupling description is in good agreement with the measured relative intensities of the 2.311 MeV and 3.945 MeV levels. At the excitation energy of 7.029 MeV an underestimation of the cross section can be appreciated. This example points out the agreements and limitations of our results in the sense that they give reliable numbers for the low lying energy levels and fail to produce the full observed intensities when states have a considerable non-p-shell contribution.

The CJULIE code was used in the DWBA calculations. We normalized the angular distributions to the ground state.

In order to show the dependence of the nuclear structure factors on the wave functions we have made calculations for several descriptions of the nuclear states.

In table 2 we compare some results obtained for two sets of wave functions given by Cohen and Kurath (i.e. Pot and 2BME[7]).

In table 3 the comparison is made between some of the results shown in table 1 and those obtained using Boyarkina's wave functions[13,14]. In both cases we verify that structure factors are essentialy independent on wave function sets provided the corresponding energy spectra are in agreement with the experimental data. The discrepances between different predictions will be hardly detected by experiments. In this

way the structure factor tables seems to be reliable in predicting nuclear cross sections.

In table 4 some intermediate coupling structure factors are compared with the values obtained in the L-S and j-j approximations. These examples confirm that the intermediate coupling scheme must be also introduced in order to get correct results for nuclear reactions.

Nevertheless, we have verified that in most cases, mainly for the lightest nuclei, the intermediate coupling factors are closely related to the L-S approximation.

It must be also pointed out that intermediate coupling structure factors give account of the different L contributions to the angular distributions, resulting in this way a powerfull tool in spectroscopic analyses.

When this paper was in preparation it came to our knowledge a work of Cohen and Kurath [15] from which table 1 can be partially deduced.

TABLE 1

AI= 4 JI= 0 TI= 0 TARGET 4HE STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
0	1	2.51	0001	1	1.000	-0.224	0.317	-0.439	0.311	
		6HE 0.		2		-0.667	0.944	-0.867	0.613	
		6LI 3.562								
		6BE (0.)								
		14.01	0001	1	0.024	-0.005	0.008	-0.010	0.008	
				2		-0.016	0.023	-0.021	0.015	
1	0	0.	0110	1	0.958	0.215			0.298	0.198
		6LI 0.		2		0.639			0.587	
			2110	1	0.277	-0.062			-0.086	-0.057
		5.06	0110	1	-0.281	-0.063			-0.087	-0.058
		6LI 6.0		2		-0.188			-0.172	
			2110	1	0.959	-0.215			-0.298	-0.199
		9.38	0110	1	-0.064	-0.014			-0.020	-0.013
				2		-0.043			-0.039	
			2110	1	-0.054	0.012			0.017	0.011
2	0	5.23	2120	1	1.000	-0.224			-0.311	-0.207
		6LI 4.57								
2	1	6.03	2021	1	0.983	0.220	-0.311	0.432	-0.305	
		6HE (1.80)								
		6LI (5.36)								
		6BE (1.5)								
		10.45	2021	1	-0.185	-0.041	0.059	-0.081	0.058	
3	0	2.14	2130	1	1.000	-0.224			-0.311	-0.207
		6LI 2.184								

AI= 6 JI= 1 TI= 0 TARGET 6LI STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
0	0	0.	0110	1	1.212	0.200			0.329	0.137
		8BE 0.		2		0.832			0.779	1.205
			2110	1	0.114	0.078			0.073	0.113
		18.50	0110	1	0.395	0.065			0.107	0.045
		8BE(24.0)		2		0.271			0.254	0.393
			2110	1	0.262	0.180			0.169	0.261
		22.95	0110	1	-0.711	-0.117			-0.193	-0.080
		8BE(24.0)		2		-0.488			-0.457	-0.707
			2110	1	0.229	0.157			0.147	0.228
1	0	14.90	0110	1	-0.020	-0.003			-0.005	-0.002
		8BE(18.15)		2		-0.013			-0.013	-0.019
			2110	1	-0.114	-0.078			-0.073	-0.113
			2120	1	0.084	0.057			0.054	0.083
		18.46	0110	1	0.128	0.021			0.035	0.014
				2		0.088			0.082	0.127
			2110	1	-0.467	-0.321			-0.300	-0.464
			2120	1	-0.864	-0.593			-0.555	-0.858
1	1	17.32	0001	1	0.104	-0.017	0.024	-0.040	0.028	
		8LI (0.975)		2		-0.071	0.101	-0.094	0.067	
		8BE(17.64)								
		8B (0.78)								
			2021	1	-0.088	0.060	-0.085	0.080	-0.056	
		18.45	0001	1	-0.052	0.009	-0.012	0.020	-0.014	
				2		0.036	-0.051	0.048	-0.034	
			2021	1	0.186	-0.128	0.181	-0.169	0.120	
		20.74	0001	1	0.474	-0.078	0.110	-0.182	0.129	
				2		-0.325	0.460	-0.431	0.305	
			2021	1	-0.657	0.451	-0.638	0.598	-0.423	
2	0	3.51	0110	1	0.137	0.023			0.037	0.015
		8BE 2.90		2		0.094			0.088	0.136
			2110	1	0.563	0.386			0.362	0.559
			2120	1	0.548	0.376			0.352	0.545
			2130	1	0.670	0.460			0.431	0.666
		14.62	0110	1	-0.216	-0.036			-0.059	-0.024
		8BE(16.93)		2		-0.148			-0.139	-0.214
			2110	1	-0.011	-0.007			-0.007	-0.011
			2120	1	0.016	0.011			0.010	0.016
			2130	1	-0.151	-0.104			-0.097	-0.150
		17.85	0110	1	-0.438	-0.072			-0.119	-0.049
		8BE(19.9)		2		-0.300			-0.281	-0.435
			2110	1	0.441	0.303			0.283	0.438
			2120	1	0.252	0.173			0.162	0.250
			2130	1	-0.456	-0.313			-0.294	-0.454
		20.78	0110	1	-0.926	-0.153			-0.252	-0.104
		8BE(22.5)		2		-0.636			-0.595	-0.920
			2110	1	-0.496	-0.340			-0.319	-0.493
			2120	1	0.039	0.027			0.025	0.039
			2130	1	0.488	0.335			0.314	0.485
		23.75	0110	1	-0.271	-0.045			-0.074	-0.031
		8BE(25.2)		2		-0.186			-0.174	-0.269
			2110	1	0.181	0.124			0.116	0.180
			2120	1	-0.130	-0.089			-0.083	-0.129
			2130	1	0.209	0.144			0.135	0.208

TABLE 1 (Continued)

AI= 6 JI= 1 TI= 0 TARGET 6LI STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
2	1	16.11	2021	1	-0.307	0.211	-0.298	0.279	-0.197	
		8LI 0.								
		8BE(16.63)								
		8B (0.)								
		19.78	2021	1	-0.235	0.161	-0.228	0.214	-0.151	
		20.80	2021	1	0.556	-0.382	0.540	-0.506	0.358	
3	0	16.69	2120	1	0.679	0.466			0.437	0.675
		8BE(19.22)								
			2130	1	0.563	0.387			0.362	0.560
		21.14	2120	1	0.184	0.126			0.118	0.183
			2130	1	-0.471	-0.323			-0.303	-0.468
		23.02	2120	1	0.254	0.174			0.163	0.252
			2130	1	-0.557	-0.383			-0.358	-0.554
3	1	17.99	2021	1	-0.615	0.422	-0.597	0.559	-0.395	
		8LI 2.26								
		8BE(19.22)								
		8B (2.17)								
		21.73	2021	1	0.141	-0.097	0.137	-0.128	0.090	
4	0	11.71	2130	1	0.186	0.128			0.120	0.185
		8BE 11.4								
		18.41	2130	1	-0.387	-0.266			-0.249	-0.385
		8BE 23.								
		23.54	2130	1	0.346	0.237			0.222	0.343

AI= 7 JI=3/2 TI=1/2 TARGET 7LI PICK UP

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	3.75	0110	1	0.627	0.122			0.184	0.101
		5HE 2.6		2		0.425			0.395	0.619
		5LI 5.10								
			2021	1	0.573	-0.389	0.550	-0.510	0.361	
			2110	1	0.171	0.116			0.108	0.169
			2120	1	-0.462	-0.313			-0.291	-0.456
3/2	1/2	0.	0001	1	0.942	-0.183	0.259	-0.390	0.276	
		5HE 0.		2		-0.638	0.903	-0.838	0.593	
		5LI 0.								
			0110	1	-0.610	-0.119			-0.179	-0.098
				2		-0.413			-0.384	-0.602
			2021	1	0.520	-0.352	0.498	-0.462	0.327	
			2110	1	0.173	0.118			0.109	0.171
			2120	1	-0.021	-0.014			-0.013	-0.020
			2130	1	-0.675	-0.458			-0.425	-0.666

AI= 7 JI=3/2 TI=1/2 TARGET 7LI STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
1/2	1/2	2.92	0110	1	0.302	0.040			0.075	0.020
		9BE 2.78		2		0.210			0.198	0.301
			2021	1	0.832	-0.578	0.817	-0.772	0.546	
			2110	1	-0.228	-0.158			-0.150	-0.228
			2120	1	-0.534	-0.370			-0.350	-0.532
		11.47	0110	1	-0.567	-0.076			-0.141	-0.037
				2		-0.394			-0.372	-0.566
			2021	1	0.154	-0.107	0.152	-0.143	0.101	
			2110	1	0.136	0.095			0.089	0.136
			2120	1	-0.256	-0.177			-0.168	-0.255
		12.23	0110	1	0.415	0.056			0.103	0.027
				2		0.288			0.272	0.414
			2021	1	-0.170	0.118	-0.167	0.158	-0.112	
			2110	1	0.112	0.078			0.074	0.112
			2120	1	-0.334	-0.232			-0.219	-0.333
		17.84	0110	1	0.209	0.028			0.052	0.014
				2		0.145			0.137	0.208
			2021	1	-0.169	0.117	-0.166	0.156	-0.111	
			2110	1	-0.371	-0.257			-0.243	-0.370
			2120	1	-0.390	-0.270			-0.256	-0.389
1/2	3/2	16.55	2021	1	0.349	-0.242	0.342	-0.323	0.229	
3/2	1/2	0.	0001	1	0.356	-0.048	0.068	-0.125	0.089	
		9BE 0.		2		-0.247	0.350	-0.331	0.234	
		9B (0.)								
			0110	1	0.189	0.025			0.047	0.012
				2		0.131			0.124	0.189
			2021	1	-0.309	0.214	-0.303	0.286	-0.202	
			2110	1	0.090	0.063			0.059	0.090
			2120	1	-0.126	-0.087			-0.082	-0.125
			2130	1	-0.684	-0.475			-0.449	-0.683

TABLE 1 (Continued)

A1= 7 JI=3/2 TI=1/2 TARGET 7LI STRIPPING BST=GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
3/2	1/2	5.01	0001	1	-0.074	0.010	-0.014	0.026	-0.018	
				2		0.051	-0.072	0.068	-0.048	
			0110	1	-0.135	-0.018			-0.033	-0.009
				2		-0.093			-0.088	-0.134
			2021	1	0.726	-0.504	0.712	-0.673	0.476	
			2110	1	-0.329	-0.228			-0.216	-0.329
			2120	1	-0.391	-0.271			-0.256	-0.390
			2130	1	0.047	0.032			0.031	0.046
		9.98	0001	1	-0.337	0.045	-0.064	0.119	-0.084	
				2		0.234	-0.331	0.313	-0.221	
			0110	1	-0.212	-0.028			-0.053	-0.014
				2		-0.147			-0.139	-0.212
			2021	1	0.124	-0.086	0.121	-0.115	0.081	
			2110	1	0.046	0.032			0.030	0.046
			2120	1	0.165	0.114			0.108	0.164
			2130	1	-0.390	-0.271			-0.256	-0.389
		13.28	0001	1	-0.505	0.068	-0.096	0.177	-0.126	
				2		0.350	-0.495	0.468	-0.331	
			0110	1	0.648	0.087			0.161	0.042
				2		0.450			0.425	0.647
			2021	1	0.181	-0.126	0.178	-0.168	0.119	
			2110	1	-0.165	-0.114			-0.108	-0.164
			2120	1	-0.148	-0.103			-0.097	-0.148
			2130	1	-0.032	-0.022			-0.021	-0.032
		15.54	0001	1	0.070	-0.009	0.013	-0.025	0.017	
				2		-0.049	0.089	-0.065	0.046	
			0110	1	-0.047	-0.006			-0.012	-0.003
				2		-0.033			-0.031	-0.047
			2021	1	-0.422	0.293	-0.414	0.391	-0.277	
			2110	1	-0.305	-0.212			-0.200	-0.304
			2120	1	-0.515	-0.357			-0.338	-0.514
			2130	1	-0.236	-0.164			-0.155	-0.235
		17.43	0001	1	-0.111	0.015	-0.021	0.039	-0.028	
				2		0.077	-0.109	0.103	-0.073	
			0110	1	0.231	0.031			0.057	0.015
				2		0.160			0.151	0.230
			2021	1	0.083	-0.057	0.081	-0.077	0.054	
			2110	1	0.644	0.447			0.422	0.643
			2120	1	-0.261	-0.181			-0.171	-0.261
			2130	1	-0.179	-0.124			-0.117	-0.178
		18.24	0001	1	0.125	-0.017	0.024	-0.044	0.031	
				2		-0.087	0.123	-0.116	0.082	
			0110	2	-0.003	-0.002			-0.002	-0.003
			2021	1	-0.285	0.198	-0.280	0.264	-0.187	
			2110	1	-0.062	-0.043			-0.041	-0.062
			2120	1	-0.149	-0.103			-0.097	-0.148
			2130	1	-0.096	-0.067			-0.063	-0.096
3/2	3/2	13.57	0001	1	0.914	-0.123	0.173	-0.322	0.227	
				2		-0.634	0.897	-0.848	0.599	
		9LI (0.)								
		98E (14.39)								
		98 (14.67)								
		9C (0.)								
			2021	1	-0.325	0.226	-0.319	0.302	-0.213	
		18.59	0001	1	0.124	-0.017	0.024	-0.044	0.031	
				2		-0.086	0.122	-0.115	0.082	
			2021	1	0.635	-0.441	0.623	-0.589	0.416	
5/2	1/2	2.72	0110	1	0.050	0.007			0.012	0.003
		98E 2.43		2		0.035			0.033	0.050
		98 (2.33)								
			2021	1	-0.680	0.472	-0.667	0.630	-0.446	
			2110	1	0.250	0.173			0.164	0.249
			2120	1	-0.133	-0.092			-0.087	-0.133
			2130	1	-0.554	-0.385			-0.363	-0.553
		7.42	0110	1	0.191	0.026			0.047	0.012
				2		0.132			0.125	0.190
			2021	1	0.002	-0.002	0.002	-0.002	0.002	
			2110	1	-0.466	-0.324			-0.306	-0.466
			2120	1	-0.297	-0.206			-0.195	-0.297
			2130	1	-0.226	-0.157			-0.148	-0.225
		11.43	0110	1	-0.825	-0.111			-0.205	-0.054
				2		-0.573			-0.541	-0.823
			2021	1	0.062	-0.043	0.061	-0.057	0.041	
			2110	1	0.055	0.038			0.036	0.055
			2120	1	-0.457	-0.317			-0.300	-0.456
			2130	1	0.145	0.101			0.095	0.145
		13.21	0110	1	0.311	0.042			0.077	0.020
				2		0.216			0.204	0.311
			2021	1	0.512	-0.355	0.502	-0.474	0.335	
			2110	1	0.257	0.179			0.169	0.257
			2120	1	-0.520	-0.361			-0.341	-0.519
			2130	1	-0.350	-0.243			-0.230	-0.350
		15.31	0110	1	-0.073	-0.010			-0.018	-0.005
				2		-0.051			-0.048	-0.073
			2021	1	0.444	-0.308	0.436	-0.412	0.291	
			2110	1	-0.138	-0.096			-0.091	-0.138
			2120	1	0.401	0.279			0.263	0.401
			2130	1	-0.408	-0.283			-0.267	-0.407

TABLE I (Continued)

AI= 7 JI=3/2 TI=1/2 TARGET 7LI STRIPPING

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
5/2	1/2	18.42		0110	1	-0.012	-0.002			-0.003	
					2		-0.009			-0.008	-0.012
				2021	1	-0.278	0.193	-0.272	0.257	-0.182	
				2110	1	0.049	0.034			0.032	0.048
				2120	1	0.028	0.020			0.018	0.028
				2130	1	0.105	0.073			0.069	0.105
		19.62		0110	1	-0.033	-0.004			-0.008	-0.002
					2		-0.023			-0.022	-0.033
				2021	1	0.081	-0.056	0.079	-0.075	0.053	
				2110	1	-0.235	-0.163			-0.154	-0.234
				2120	1	-0.130	-0.090			-0.085	-0.129
				2130	1	-0.100	-0.069			-0.065	-0.100
5/2	3/2	17.13		2021	1	-0.839	0.582	-0.823	0.778	-0.550	
7/2	1/2	6.45		2021	1	-0.606	0.420	-0.594	0.562	-0.397	
		9BE	6.66								
				2120	1	-0.281	-0.195			-0.184	-0.281
				2130	1	-0.655	-0.455			-0.430	-0.654
		10.22		2021	1	-0.301	0.209	-0.295	0.279	-0.197	
				2120	1	-0.416	-0.289			-0.273	-0.415
				2130	1	0.590	0.409			0.387	0.589
		12.47		2021	1	0.135	-0.094	0.132	-0.125	0.088	
				2120	1	-0.059	-0.041			-0.039	-0.059
				2130	1	0.321	0.223			0.211	0.321
		15.75		2021	1	-0.017	0.012	-0.017	0.016	-0.011	
				2120	1	-0.015	-0.011			-0.010	-0.015
				2130	1	0.188	0.130			0.123	0.187
		19.10		2021	1	0.177	-0.123	0.174	-0.165	0.116	
				2120	1	-0.155	-0.108			-0.102	-0.155
				2130	1	0.241	0.167			0.158	0.240
7/2	3/2	20.00		2021	1	-0.279	0.194	-0.274	0.259	-0.183	
9/2	1/2	11.43		2130	1	0.035	0.024			0.023	0.035
		16.79		2130	1	0.242	0.168			0.159	0.242

AI= 9 JI=3/2 TI=1/2 TARGET 9BE PICK UP

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	1.00		0110	1	-0.176	-0.024			-0.044	-0.011
		7LI	0.478		2		-0.122			-0.115	-0.176
		7BE	0.431								
				2021	1	-0.774	0.537	-0.759	0.717	-0.507	
				2110	1	0.047	0.032			0.031	0.047
				2120	1	-0.306	-0.212			-0.201	-0.306
		10.22		0110	1	-0.335	-0.045			-0.083	-0.022
					2		-0.233			-0.220	-0.335
				2021	1	0.303	-0.210	0.298	-0.281	0.199	
				2110	1	0.124	0.086			0.081	0.124
				2120	1	0.139	0.096			0.091	0.139
		12.35		0110	1	-0.014	-0.002			-0.003	
					2		-0.010			-0.009	-0.014
				2021	1	0.217	-0.151	0.213	-0.201	0.142	
				2110	1	-0.133	-0.092			-0.087	-0.132
				2120	1	-0.305	-0.212			-0.200	-0.304
		17.37		0110	1	0.038	0.005			0.010	0.003
					2		0.027			0.025	0.038
				2021	1	-0.063	0.044	-0.062	0.059	-0.042	
				2110	1	0.286	0.198			0.187	0.285
				2120	1	-0.072	-0.050			-0.047	-0.072
1/2	3/2	10.22		2021	1	0.496	-0.344	0.487	-0.460	0.325	
3/2	1/2	0.		0001	1	0.356	-0.048	0.068	-0.125	0.089	
		7LI	0.		2		-0.247	0.350	-0.331	0.234	
		7BE	(0.)								
				0110	1	0.189	0.025			0.047	0.012
					2		0.131			0.124	0.189
				2021	1	-0.309	0.214	-0.303	0.286	-0.202	
				2110	1	0.090	0.063			0.059	0.090
				2120	1	-0.126	-0.087			-0.082	-0.125
				2130	1	-0.684	-0.475			-0.449	-0.683
		10.61		0001	1	-0.216	0.029	-0.041	0.076	-0.054	
		7BE	(9.9)		2		0.150	-0.211	0.200	-0.141	
				0110	1	-0.259	-0.035			-0.064	-0.017
					2		-0.180			-0.170	-0.259
				2021	1	0.004	-0.002	0.003	-0.003	0.002	
				2110	1	-0.015	-0.010			-0.010	-0.015
				2120	1	-0.141	-0.098			-0.092	-0.140
				2130	1	-0.402	-0.279			-0.264	-0.402
		11.96		0001	1	-0.403	0.054	-0.076	0.142	-0.100	
					2		0.280	-0.395	0.374	-0.264	
				0110	1	0.611	0.082			0.152	0.040
					2		0.424			0.400	0.609
				2021	1	0.065	-0.045	0.064	-0.060	0.043	
				2110	1	0.024	0.017			0.016	0.024
				2120	1	0.027	0.018			0.017	0.027
				2130	1	-0.042	-0.029			-0.027	-0.041

TABLE 1 (Continued)

AI= 9 JI=3/2 TI=1/2 TARGET 9BE PICK UP

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
3/2	1/2	14.72	0001	1	-0.109	0.015	-0.021	0.038	-0.027	
				2		0.075	-0.107	0.101	-0.071	
			0110	1	-0.073	-0.010			-0.018	-0.005
				2		-0.050			-0.048	-0.072
			2021	1	-0.267	0.185	-0.262	0.248	-0.175	
			2110	1	0.076	0.053			0.050	0.076
			2120	1	0.334	0.232			0.219	0.333
			2130	1	-0.070	-0.048			-0.046	-0.069
		16.97	0001	1	0.077	-0.010	0.015	-0.027	0.019	
				2		-0.054	0.076	-0.072	0.051	
			0110	1	0.093	0.012			0.023	0.006
				2		0.064			0.061	0.093
			2021	1	0.202	-0.140	0.198	-0.187	0.132	
			2110	1	0.342	0.237			0.224	0.341
			2120	1	0.082	0.057			0.054	0.082
			2130	1	-0.002	-0.001				-0.002
3/2	3/2	13.17	0001	1	-1.082	0.145	-0.205	0.381	-0.269	
		7HE (0.)		2		0.751	-1.062	1.004	-0.710	
		7LI(11.13)								
		7BE(10.79)								
		7B (0.)								
			2021	1	-0.040	0.028	-0.039	0.037	-0.026	
		17.06	0001	1	-0.018	0.002	-0.003	0.006	-0.005	
				2		0.013	-0.018	0.017	-0.012	
			2021	1	-0.401	0.278	-0.393	0.372	-0.263	
5/2	1/2	7.28	0110	1	0.234	0.031			0.058	0.015
		7LI (6.56)		2		0.162			0.153	0.233
		7BE 6.51								
			2021	1	0.031	-0.022	0.030	-0.029	0.020	
			2110	1	-0.493	-0.342			-0.323	-0.492
			2120	1	0.142	0.099			0.093	0.142
			2130	1	-0.119	-0.083			-0.078	-0.119
		9.18	0110	1	0.591	0.079			0.147	0.039
		7LI 7.48		2		0.410			0.388	0.590
		7BE (7.19)								
			2021	1	-0.037	0.026	-0.036	0.034	-0.024	
			2110	1	0.122	0.084			0.080	0.121
			2120	1	-0.151	-0.105			-0.099	-0.151
			2130	1	-0.113	-0.078			-0.074	-0.113
		12.08	0110	1	-0.083	-0.011			-0.021	-0.005
				2		-0.057			-0.054	-0.083
			2021	1	0.154	-0.107	0.151	-0.143	0.101	
			2110	1	0.022	0.015			0.015	0.022
			2120	1	0.412	0.286			0.270	0.411
			2130	1	-0.041	-0.028			-0.027	-0.041
		14.89	0110	1	0.540	0.072			0.134	0.035
				2		0.375			0.354	0.539
			2021	1	-0.169	0.117	-0.166	0.157	-0.111	
			2110	1	0.101	0.070			0.066	0.101
			2120	1	0.141	0.098			0.092	0.140
			2130	1	0.339	0.235			0.222	0.338
5/2	3/2	9.18	2021	1	-0.606	0.421	-0.595	0.562	-0.398	
7/2	1/2	5.06	2021	1	0.626	-0.434	0.614	-0.580	0.410	
		7LI (4.63)								
		7BE 4.55								
			2120	1	-0.468	-0.325			-0.307	-0.468
			2130	1	0.132	0.091			0.086	0.131
		11.19	2021	1	-0.049	0.034	-0.049	0.046	-0.032	
			2120	1	0.241	0.167			0.158	0.241
			2130	1	0.436	0.302			0.286	0.435

AI= 9 JI=3/2 TI=1/2 TARGET 9BE STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
1/2	1/2	1.71	0110	1	-0.635	-0.047			-0.127	0.016
		11B 2.124		2		-0.446			-0.429	-0.635
		11C 1.995								
			2021	1	-0.706	0.497	-0.702	0.675	-0.477	
			2110	1	-0.141	-0.099			-0.095	-0.141
			2120	1	-0.552	-0.388			-0.373	-0.552
		11.61	0110	1	-0.436	-0.032			-0.087	0.011
				2		-0.307			-0.295	-0.436
			2021	1	-0.191	0.135	-0.190	0.183	-0.129	
			2110	1	0.456	0.321			0.308	0.456
			2120	1	0.361	0.254			0.244	0.361
		12.01	0110	1	-0.063	-0.005			-0.013	0.002
				2		-0.045			-0.043	-0.063
			2021	1	-0.094	0.066	-0.094	0.090	-0.064	
			2110	1	-0.052	-0.037			-0.035	-0.052
			2120	1	0.136	0.096			0.092	0.136
		16.82	0110	1	0.240	0.018			0.048	-0.006
				2		0.168			0.162	0.240
			2021	1	-0.219	0.154	-0.218	0.210	-0.148	
			2110	1	-0.067	-0.047			-0.045	-0.067
			2120	1	0.218	0.153			0.147	0.218

TABLE 1 (Continued)

AI= 9 JI=3/2 TI=1/2 TARGET 9BE

STRIPPING

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
1/2	3/2	13.56		2021	1	0.325	-0.229	0.324	-0.311	0.220	
		11BE	(0.32)								
		11B	13.02								
		11C	12.45								
3/2	1/2	0.		0001	1	1.054	-0.078	0.110	-0.299	0.211	
					2		-0.741	1.049	-1.008	0.713	
		11B	0.								
		11C	0.								
				0110	1	-0.305	-0.022			-0.061	0.007
					2		-0.214			-0.206	-0.305
				2021	1	0.307	-0.216	0.305	-0.293	0.207	
				2110	1	0.265	0.187			0.179	0.265
				2120	1	-0.092	-0.065			-0.062	-0.092
				2130	1	-0.667	-0.469			-0.451	-0.667
		5.39		0001	1	0.131	-0.010	0.014	-0.037	0.026	
		11B	(5.019)		2		-0.092	0.130	-0.125	0.088	
		11C	4.794								
				0110	1	-0.420	-0.031			-0.084	0.010
					2		-0.295			-0.284	-0.420
				2021	1	0.352	-0.247	0.350	-0.336	0.238	
				2110	1	-0.084	-0.059			-0.057	-0.084
				2120	1	0.043	0.030			0.029	0.043
				2130	1	-0.157	-0.110			-0.106	-0.157
		11.44		0001	1	-0.052	0.004	-0.005	0.015	-0.010	
		11B	(10.25)		2		0.037	-0.052	0.050	-0.035	
				0110	1	-0.594	-0.044			-0.119	0.015
					2		-0.418			-0.401	-0.594
				2021	1	0.412	-0.290	0.410	-0.394	0.278	
				2110	1	-0.297	-0.209			-0.201	-0.297
				2120	1	0.352	0.248			0.238	0.352
				2130	1	-0.050	-0.035			-0.034	-0.050
		13.36		0001	1	0.027	-0.002	0.003	-0.008	0.005	
					2		-0.019	0.027	-0.026	0.018	
				0110	1	-0.076	-0.006			-0.015	0.002
					2		-0.053			-0.051	-0.076
				2021	1	0.088	-0.062	0.088	-0.084	0.060	
				2110	1	-0.209	-0.147			-0.141	-0.209
				2120	1	-0.332	-0.234			-0.225	-0.332
				2130	1	-0.095	-0.067			-0.064	-0.095
		13.44		0001	1	0.073	-0.005	0.008	-0.021	0.015	
					2		-0.051	0.073	-0.070	0.049	
				0110	1	-0.024	-0.002			-0.005	
					2		-0.017			-0.017	-0.024
				2021	1	-0.168	0.118	-0.167	0.161	-0.114	
				2110	1	-0.038	-0.027			-0.026	-0.038
				2120	1	0.186	0.131			0.126	0.186
				2130	1	0.222	0.156			0.150	0.222
		15.05		0001	1	-0.247	0.018	-0.026	0.070	-0.049	
					2		0.174	-0.245	0.236	-0.167	
				0110	1	0.231	0.017			0.046	-0.006
					2		0.163			0.156	0.231
				2021	1	0.248	-0.174	0.246	-0.237	0.167	
				2110	1	0.251	0.176			0.169	0.251
				2120	1	-0.084	-0.059			-0.057	-0.084
				2130	1	0.215	0.151			0.145	0.215
		16.77		0001	1	-0.087	0.006	-0.009	0.025	-0.017	
					2		0.061	-0.087	0.083	-0.059	
				0110	1	0.010	0.007			0.002	
					2					0.007	0.010
				2021	1	0.003	-0.002	0.003	-0.003	0.002	
				2110	1	-0.020	-0.014			-0.014	-0.020
				2120	1	0.005	0.004			0.004	0.005
				2130	1	0.287	0.202			0.194	0.287
3/2	3/2	15.84		0001	1	0.484	-0.036	0.050	-0.137	0.097	
					2		-0.340	0.481	-0.462	0.327	
				2021	1	-0.547	0.384	-0.544	0.523	-0.369	
		18.48		0001	1	-0.454	0.033	-0.047	0.129	-0.091	
					2		0.319	-0.452	0.434	-0.307	
				2021	1	0.539	-0.379	0.536	-0.515	0.364	
5/2	1/2	4.35		0110	2	-0.002	-0.001			-0.001	-0.002
		11B	4.444								
		11C	4.305								
				2021	1	0.121	-0.085	0.121	-0.116	0.082	
				2110	1	0.149	0.105			0.101	0.149
				2120	1	-0.002	-0.001			-0.001	-0.002
				2130	1	-0.002	-0.002			-0.002	-0.002
		8.10		0110	1	0.447	0.033			0.090	-0.011
		11B	(8.93)		2		0.314			0.302	0.447
		11C	(8.42)								
				2021	1	-0.284	0.200	-0.282	0.271	-0.192	
				2110	1	-0.347	-0.244			-0.235	-0.347
				2120	1	0.183	0.129			0.124	0.183
				2130	1	-0.370	-0.260			-0.250	-0.369
		10.68		0110	1	0.214	0.016			0.043	-0.005
		11B	(10.33)		2		0.150			0.144	0.214
				2021	1	0.567	-0.399	0.564	-0.542	0.383	
				2110	1	0.138	0.097			0.093	0.138
				2120	1	0.613	0.431			0.414	0.613
				2130	1	0.002	0.001			0.001	0.002
		14.40		0110	1	0.261	0.019			0.052	-0.006
		11B	(11.0)		2		0.183			0.176	0.261
				2021	1	-0.240	0.169	-0.238	0.229	-0.162	
				2110	1	0.139	0.098			0.094	0.139
				2120	1	-0.066	-0.047			-0.045	-0.066
				2130	1	-0.501	-0.353			-0.339	-0.501

TABLE 1 (Continued)

AI= 9 JI=3/2 TI=1/2 TARGET 9BE STRIPPING

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
5/2	1/2	15.81		0110	1	0.057	0.004			0.011	-0.001
					2		0.040			0.039	0.057
				2021	1	0.142	-0.100	0.141	-0.136	0.096	
				2110	1	-0.023	-0.016			-0.016	-0.023
				2120	1	-0.112	-0.079			-0.076	-0.112
				2130	1	-0.084	-0.059			-0.057	-0.084
		17.10		0110	1	0.251	0.018			0.050	-0.006
					2		0.176			0.169	0.251
				2021	1	0.045	-0.031	0.044	-0.043	0.030	
				2110	1	-0.059	-0.041			-0.040	-0.059
				2120	1	0.122	0.086			0.083	0.122
				2130	1	-0.083	-0.059			-0.056	-0.083
5/2	3/2	18.22		2021	1	-0.400	0.281	-0.397	0.382	-0.270	
7/2	1/2	5.84		2021	1	-0.648	0.455	-0.644	0.619	-0.438	
		11B	6.743								
		11C	6.48								
				2120	1	0.181	0.127			0.122	0.181
				2130	1	0.450	0.317			0.304	0.450
		12.64		2021	1	-0.062	0.043	-0.061	0.059	-0.042	
				2120	1	-0.098	-0.069			-0.066	-0.098
				2130	1	0.501	0.352			0.338	0.501
		15.07		2021	1	0.059	-0.041	0.058	-0.056	0.040	
				2120	1	0.182	0.128			0.123	0.182
				2130	1	-0.202	-0.142			-0.136	-0.202
		16.61		2021	1	-0.028	0.020	-0.028	0.027	-0.019	
				2120	1	-0.017	-0.012			-0.012	-0.017
				2130	1	0.068	0.048			0.046	0.068
		19.82		2021	1	-0.004	0.003	-0.004	0.004	-0.003	
				2120	1	-0.149	-0.105			-0.100	-0.149
				2130	1	0.179	0.126			0.121	0.179
7/2	3/2	21.55		2021	1	0.080	-0.056	0.079	-0.076	0.054	
9/2	1/2	12.72		2130	1	-0.010	-0.007			-0.007	-0.010
		19.67		2130	1	0.052	0.037			0.035	0.052

AI=10 JI= 3 TI= 0 TARGET 10B PICK UP

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
0	0	0.		2130	1	0.529	0.370			0.353	0.529
		8BE 0.									
		18.50		2130	1	0.293	0.205			0.195	0.293
		8BE(24.0)									
		22.95		2130	1	0.140	0.098			0.093	0.140
		8BE(24.0)									
1	0	14.90		2120	1	-0.199	-0.139			-0.132	-0.199
		8BE(18.15)									
				2130	1	-0.126	-0.088			-0.084	-0.126
		18.46		2120	1	-0.226	-0.158			-0.150	-0.226
				2130	1	0.242	0.169			0.161	0.242
1	1	17.32		2021	1	0.630	-0.440	0.623	-0.594	0.420	
		8LI (0.975)									
		8BE(17.64)									
		8B (0.78)									
		18.45		2021	1	-0.324	0.226	-0.320	0.305	-0.216	
		20.74		2021	1	0.221	-0.155	0.219	-0.208	0.147	
2	0	3.51		0110	1	0.053	0.006			0.012	
		8BE 2.90			2		0.037			0.036	0.053
				2110	1	-0.299	-0.209			-0.199	-0.299
				2120	1	0.662	0.463			0.441	0.662
				2130	1	-0.643	-0.450			-0.429	-0.643
		14.62		0110	1	-0.087	-0.009			-0.020	-0.002
		8BE(16.93)			2		-0.061			-0.058	-0.087
				2110	1	-0.175	-0.123			-0.117	-0.175
				2120	1	-0.314	-0.220			-0.210	-0.314
				2130	1	-0.313	-0.219			-0.209	-0.313
		17.85		0110	1	-0.200	-0.021			-0.045	-0.004
		8BE(19.9)			2		-0.140			-0.134	-0.200
				2110	1	0.218	0.152			0.145	0.218
				2120	1	-0.206	-0.144			-0.137	-0.206
				2130	1	-0.013	-0.009			-0.009	-0.013
		20.78		0110	1	0.087	0.009			0.019	0.002
		8BE(22.5)			2		0.061			0.058	0.087
				2110	1	0.121	0.085			0.081	0.121
				2120	1	0.250	0.175			0.166	0.250
				2130	1	0.040	0.028			0.027	0.040
		23.75		0110	1	0.024	0.003			0.005	
		8BE(25.2)			2		0.017			0.016	0.024
				2110	1	-0.219	-0.153			-0.146	-0.219
				2120	1	0.149	0.104			0.099	0.149
				2130	1	-0.040	-0.028			-0.027	-0.040
2	1	16.11		2021	1	0.203	-0.142	0.201	-0.191	0.135	
		8LI 0.									
		8BE(16.63)									
		8B (0.)									
		19.78		2021	1	-0.171	0.120	-0.169	0.161	-0.114	
		20.80		2021	1	0.667	-0.467	0.660	-0.629	0.445	

TABLE 1 (Continued)

AI=10 JI= 3 TI= 0 TARGET 10B PICK UP

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
3	0	16.69	0110	1	0.234	0.024			0.053	0.004
		88E(19.22)		2		0.164			0.156	0.234
			2110	1	0.006	0.004			0.004	0.006
			2120	1	-0.318	-0.223			-0.212	-0.318
			2130	1	-0.595	-0.416			-0.397	-0.595
		21.14	0110	1	-0.109	-0.011			-0.024	-0.002
				2		-0.076			-0.073	-0.109
			2110	1	-0.416	-0.291			-0.277	-0.416
			2120	1	0.128	0.090			0.086	0.128
			2130	1	-0.251	-0.176			-0.168	-0.251
		23.02	0110	1	-0.500	-0.051			-0.112	-0.009
				2		-0.350			-0.333	-0.500
			2110	1	-0.129	-0.090			-0.086	-0.129
			2120	1	-0.456	-0.319			-0.304	-0.456
			2130	1	-0.020	-0.014			-0.013	-0.020
3	1	17.99	0001	1	-0.782	0.081	-0.114	0.248	-0.175	
		8LI 2.26		2		0.547	-0.774	0.737	-0.521	
		88E(19.22)								
		8B (2.17)								
			2021	1	0.649	-0.454	0.642	-0.612	0.433	
		21.73	0001	1	-0.526	0.054	-0.077	0.167	-0.118	
				2		0.368	-0.521	0.496	-0.351	
			2021	1	-0.220	0.154	-0.218	0.207	-0.147	
4	0	11.71	0110	1	-0.041	-0.004			-0.009	
		88E 11.4		2		-0.029			-0.027	-0.041
			2110	1	0.509	0.356			0.340	0.509
			2120	1	-0.133	-0.093			-0.089	-0.133
			2130	1	-0.034	-0.024			-0.023	-0.034
		18.41	0110	1	-0.190	-0.020			-0.043	-0.003
		88E 23.		2		-0.133			-0.127	-0.190
			2110	1	-0.177	-0.124			-0.118	-0.177
			2120	1	-0.120	-0.084			-0.080	-0.120
			2130	1	0.736	0.515			0.491	0.736
		23.54	0110	1	0.752	0.077			0.169	0.014
				2		0.526			0.501	0.752
			2110	1	-0.145	-0.102			-0.097	-0.145
			2120	1	-0.286	-0.200			-0.190	-0.286
			2130	1	0.055	0.038			0.037	0.055
4	1	17.63	2021	1	-0.879	0.615	-0.869	0.829	-0.586	

AI=10 JI= 3 TI= 0 TARGET 10B STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
0	0	0.	2130	1	-1.361	-0.961			-0.932	-1.358
		12C 0.								
		13.47	2130	1	-0.292	-0.206			-0.200	-0.292
		12C (7.653)								
1	0	12.44	2120	1	0.727	0.513			0.497	0.725
		12C 12.71								
			2130	1	0.233	0.165			0.160	0.233
		19.18	2120	1	-0.372	-0.263			-0.255	-0.371
			2130	1	-0.391	-0.276			-0.267	-0.390
1	1	15.08	2021	1	-0.077	0.054	-0.077	0.075	-0.053	
		12B 0.								
		12C 15.11								
		12N 0.								
		19.50	2021	1	-0.135	0.095	-0.134	0.130	-0.092	
		12B (5.00)								
2	0	4.64	0110	1	0.541	0.022			0.093	-0.039
		12C 4.439		2		0.382			0.371	0.540
			2110	1	0.030	0.021			0.021	0.030
			2120	1	-0.102	-0.072			-0.070	-0.102
			2130	1	0.291	0.205			0.199	0.290
		15.73	0110	1	-0.019				-0.003	0.001
		12C(19.39)		2		-0.013			-0.013	-0.019
			2110	1	-0.201	-0.142			-0.138	-0.201
			2120	1	-0.316	-0.223			-0.216	-0.315
			2130	1	0.947	0.668			0.648	0.944
		18.12	0110	1	0.355	0.015			0.061	-0.025
		12C (19.39)		2		0.251			0.243	0.354
			2110	1	-0.597	-0.422			-0.409	-0.596
			2120	1	0.036	0.026			0.025	0.036
			2130	1	-0.171	-0.121			-0.117	-0.171
2	1	16.68	2021	1	-0.530	0.374	-0.529	0.513	-0.363	
		12B 0.953								
		12C 16.11								
		12N (0.969)								
		20.03	2021	1	0.486	-0.343	0.486	-0.471	0.333	
		12B 3.76								
		12C 18.84								
3	0	17.25	0110	1	0.468	0.019			0.081	-0.033
				2		0.330			0.320	0.466
			2110	1	0.262	0.185			0.180	0.262
			2120	1	-0.035	-0.024			-0.024	-0.034
			2130	1	-0.098	-0.069			-0.067	-0.098

TABLE 1 (Continued)

AI=10 JI= 3 TI= 0 TARGET 10B STRIPPING

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
3	1	19.62	0001	1	-0.638	0.026	-0.037	0.155	-0.110	
				2		0.450	-0.637	0.618	-0.437	
			2021	1	0.090	-0.064	0.090	-0.088	0.062	
4	0	13.49	0110	1	-0.011				-0.002	
		12C (14.08)		2		-0.008			-0.008	-0.011
			2110	1	-0.328	-0.232			-0.225	-0.327
			2120	1	-0.357	-0.252			-0.245	-0.356
			2130	1	-0.648	-0.457			-0.443	-0.646
4	1	26.26	2021	1	0.009	-0.007	0.009	-0.009	0.006	

AI=11 JI=3/2 TI=1/2 TARGET 11B PICK UP

BST*GNLSJT

JF	TF	E	LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	1.79	0110	1	0.390	0.029			0.078	-0.010
		9BE 2.78		2		0.274			0.263	0.390
			2021	1	0.345	-0.243	0.343	-0.330	0.233	
			2110	1	0.078	0.055			0.053	0.078
			2120	1	-0.393	-0.276			-0.266	-0.393
		11.02	0110	1	-0.157	-0.012			-0.031	0.004
				2		-0.110			-0.106	-0.157
			2021	1	0.137	-0.096	0.136	-0.131	0.092	
			2110	1	0.401	0.282			0.271	0.400
			2120	1	0.443	0.311			0.299	0.443
		12.04	0110	1	0.363	0.027			0.073	-0.009
				2		0.256			0.246	0.363
			2021	1	0.396	-0.279	0.394	-0.379	0.268	
			2110	1	0.108	0.076			0.073	0.108
			2120	1	-0.074	-0.052			-0.050	-0.074
		16.70	0110	1	0.030	0.002			0.006	
				2		0.021			0.020	0.030
			2021	1	0.198	-0.139	0.197	-0.189	0.134	
			2110	1	-0.178	-0.125			-0.120	-0.178
			2120	1	0.232	0.163			0.157	0.232
		19.88	0110	1	-0.216	-0.016			-0.043	0.005
				2		-0.152			-0.146	-0.216
			2021	1	0.127	-0.089	0.126	-0.121	0.086	
			2110	1	-0.332	-0.234			-0.224	-0.332
			2120	1	0.059	0.042			0.040	0.059
1/2	3/2	11.58	2021	1	0.009	-0.007	0.009	-0.009	0.006	
		17.49	2021	1	1.113	-0.783	1.107	-1.064	0.752	
3/2	1/2	0.	0001	1	1.054	-0.078	0.110	-0.299	0.211	
				2		-0.741	1.049	-1.008	0.713	
		9BE 0.								
		9B (0.)								
			0110	1	-0.305	-0.022			-0.061	0.007
				2		-0.214			-0.206	-0.305
			2021	1	0.307	-0.216	0.305	-0.293	0.207	
			2110	1	0.265	0.187			0.179	0.265
			2120	1	-0.092	-0.065			-0.062	-0.092
			2130	1	-0.667	-0.469			-0.451	-0.667
		4.66	0001	1	0.211	-0.016	0.022	-0.060	0.042	
				2		-0.148	0.209	-0.201	0.142	
			0110	1	0.389	0.029			0.078	-0.010
				2		0.273			0.263	0.389
			2021	1	-0.387	0.272	-0.385	0.370	-0.262	
			2110	1	0.099	0.069			0.067	0.099
			2120	1	-0.112	-0.079			-0.076	-0.112
			2130	1	-0.007	-0.005			-0.005	-0.007
		10.04	0001	1	-0.056	0.004	-0.006	0.016	-0.011	
				2		0.039	-0.055	0.053	-0.038	
			0110	1	0.215	0.016			0.043	-0.005
				2		0.151			0.145	0.215
			2021	1	-0.111	0.078	-0.110	0.106	-0.075	
			2110	1	0.144	0.102			0.098	0.144
			2120	1	0.286	0.201			0.193	0.286
			2130	1	0.699	0.491			0.472	0.699
		12.66	0001	1	-0.244	0.018	-0.025	0.069	-0.049	
				2		0.172	-0.243	0.233	-0.165	
			0110	1	-0.398	-0.029			-0.080	0.010
				2		-0.280			-0.269	-0.398
			2021	1	0.103	-0.073	0.103	-0.099	0.070	
			2110	1	0.051	0.036			0.034	0.051
			2120	1	0.055	0.039			0.037	0.055
			2130	1	0.018	0.012			0.012	0.018
		15.46	0001	1	-0.100	0.007	-0.010	0.028	-0.020	
				2		0.071	-0.100	0.096	-0.068	
			0110	2	0.003	0.002			0.002	0.003
			2021	1	-0.303	0.213	-0.302	0.290	-0.205	
			2120	1	-0.153	-0.108			-0.103	-0.153
			2130	1	0.074	0.052			0.050	0.074

TABLE 1 (Continued)

AI=11 JI=3/2 TI=1/2 TARGET 11B PICK UP BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
3/2	1/2	16.10		0001	1	-0.098	0.007	-0.010	0.028	-0.020	
					2		0.069	-0.097	0.094	-0.066	
				0110	1	0.155	0.011			0.031	-0.004
					2		0.109			0.105	0.155
				2021	1	-0.198	0.140	-0.197	0.190	-0.134	
				2110	1	-0.229	-0.161			-0.155	-0.229
				2120	1	-0.425	-0.299			-0.288	-0.425
				2130	1	-0.165	-0.116			-0.111	-0.165
		16.93		0001	1	-0.038	0.003	-0.004	0.011	-0.008	
					2		0.027	-0.038	0.037	-0.026	
				0110	1	0.070	0.005			0.014	-0.002
					2		0.049			0.048	0.070
				2021	1	0.283	-0.199	0.281	-0.270	0.191	
				2110	1	-0.313	-0.220			-0.211	-0.313
				2120	1	-0.181	-0.127			-0.122	-0.181
				2130	1	0.280	0.197			0.189	0.280
3/2	3/2	13.61		0001	1	-0.816	0.060	-0.085	0.231	-0.164	
					2		0.574	-0.812	0.780	-0.552	
		9L I (0.)									
		9BE(14.39)									
		9B (14.67)									
		9C (0.)									
				2021	1	0.230	-0.161	0.228	-0.219	0.155	
		18.48		0001	1	-0.378	0.028	-0.039	0.107	-0.076	
					2		0.266	-0.376	0.361	-0.255	
				2021	1	-0.528	0.371	-0.525	0.505	-0.357	
5/2	1/2	2.94		0110	1	-0.187	-0.014			-0.037	0.005
		9BE 2.43			2		-0.131			-0.126	-0.187
		9B (2.33)									
				2021	1	-0.048	0.033	-0.047	0.046	-0.032	
				2110	1	0.360	0.253			0.243	0.360
				2120	1	0.269	0.189			0.182	0.269
				2130	1	0.039	0.027			0.026	0.039
		7.37		0110	2	-0.004	-0.003			-0.003	-0.004
				2021	1	0.160	-0.112	0.159	-0.153	0.108	
				2110	1	-0.592	-0.416			-0.400	-0.592
				2120	1	0.322	0.227			0.218	0.322
		10.87		0110	1	-0.582	-0.043			-0.117	0.014
					2		-0.410			-0.394	-0.582
				2021	1	0.024	-0.017	0.024	-0.023	0.016	
				2110	1	0.031	0.022			0.021	0.031
				2120	1	0.108	0.076			0.073	0.108
				2130	1	0.124	0.087			0.084	0.124
		12.51		0110	1	0.035	0.003			0.007	
					2		0.025			0.024	0.035
				2021	1	-0.116	0.081	-0.115	0.110	-0.078	
				2110	1	-0.183	-0.129			-0.124	-0.183
				2120	1	0.341	0.240			0.230	0.341
				2130	1	0.018	0.012			0.012	0.017
		13.95		0110	1	-0.395	-0.029			-0.079	0.010
					2		-0.278			-0.267	-0.395
				2021	1	-0.158	0.111	-0.157	0.151	-0.107	
				2110	1	-0.173	-0.121			-0.117	-0.173
				2120	1	-0.197	-0.138			-0.133	-0.197
				2130	1	-0.539	-0.379			-0.364	-0.539
		18.01		0110	1	-0.006				-0.001	
					2		-0.004			-0.004	-0.006
				2021	1	-0.004	0.003	-0.004	0.004	-0.003	
				2110	1	-0.047	-0.033			-0.032	-0.047
				2120	1	0.036	0.026			0.025	0.036
				2130	1	0.120	0.084			0.081	0.120
		18.78		2021	1	0.260	-0.183	0.259	-0.249	0.176	
				2110	1	0.228	0.160			0.154	0.228
				2120	1	-0.193	-0.136			-0.130	-0.193
				2130	1	0.067	0.047			0.045	0.067
5/2	3/2	17.39		2021	1	-0.436	0.306	-0.433	0.416	-0.294	
7/2	1/2	6.19		2021	1	-1.008	0.709	-1.003	0.964	-0.681	
		9BE 6.66									
				2120	1	-0.606	-0.426			-0.410	-0.606
				2130	1	0.267	0.188			0.180	0.267
		9.85		2021	1	-0.425	0.299	-0.423	0.406	-0.287	
				2120	1	-0.415	-0.292			-0.281	-0.415
				2130	1	-0.343	-0.241			-0.232	-0.343
		12.86		2021	1	-0.159	0.112	-0.158	0.152	-0.108	
				2120	1	0.174	0.122			0.118	0.174
				2130	1	-0.371	-0.261			-0.251	-0.371
		15.38		2021	1	0.007	-0.005	0.007	-0.007	0.005	
				2120	1	-0.286	-0.201			-0.193	-0.286
				2130	1	-0.155	-0.109			-0.105	-0.155
		18.40		2021	1	-0.057	0.040	-0.057	0.054	-0.038	
				2120	1	-0.072	-0.051			-0.049	-0.072
				2130	1	0.177	0.124			0.119	0.177
		19.49		2021	1	-0.034	0.024	-0.034	0.033	-0.023	
				2120	1	-0.245	-0.172			-0.165	-0.245
				2130	1	-0.081	-0.057			-0.055	-0.081
7/2	3/2	19.78		2021	1	0.099	-0.070	0.099	-0.095	0.067	
9/2	1/2	11.01		2130	1	-0.007	-0.005			-0.005	-0.007
		16.29		2130	1	0.016	0.011			0.011	0.016

TABLE 1 (Continued)

AI=11 JI=3/2 TI=1/2 TARGET 11B STRIPPING

BST=GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
1/2	1/2	0.		0110	1/2	0.067				0.010	-0.008
							0.048			0.046	0.067
		13C	0.								
		13N	0.								
				2021	1	0.300	-0.212	0.300	-0.293	0.207	
				2110	1	-0.218	-0.154			-0.151	-0.216
				2120	1	-0.561	-0.397			-0.388	-0.558
		8.78		0110	1/2	0.179	0.002			0.026	-0.020
		13C	8.85				0.127			0.124	0.178
		13N	8.92								
				2021	1	0.079	-0.056	0.079	-0.078	0.055	
				2110	1	-0.101	-0.071			-0.070	-0.100
				2120	1	-0.147	-0.104			-0.102	-0.146
		13.81		0110	1/2	0.178	0.002			0.026	-0.020
		13C	(11.08)				0.126			0.123	0.177
		13N	10.78								
				2021	1	-0.006	0.004	-0.006	0.006	-0.004	
				2110	1	-0.152	-0.107			-0.105	-0.151
				2120	1	-0.225	-0.157			-0.154	-0.221
		17.41		0110	1/2	0.467	0.005			0.068	-0.053
							0.330			0.323	0.464
				2021	1	-0.008	0.006	-0.008	0.008	-0.006	
				2110	1	-0.218	-0.154			-0.151	-0.217
				2120	1	-0.162	-0.115			-0.112	-0.161
1/2	3/2	18.79		2021	1	-0.128	0.091	-0.128	0.125	-0.089	
3/2	1/2	3.59		0001	1/2	0.400	-0.004	0.006	-0.082	0.058	
		13C	3.684				-0.283	0.400	-0.391	0.276	
		13N	3.509								
				0110	1/2	0.055				0.008	-0.006
							0.039			0.038	0.055
				2021	1	-0.727	0.514	-0.727	0.711	-0.503	
				2110	1	0.137	0.097			0.095	0.136
				2120	1	-0.263	-0.186			-0.182	-0.261
				2130	1	-0.321	-0.227			-0.222	-0.319
		10.43		0001	1/2	-0.312	0.003	-0.004	0.064	-0.045	
		13C	9.50				0.221	-0.312	0.305	-0.216	
		13N	9.52								
				0110	1/2	-0.044				-0.006	0.005
							-0.031			-0.031	-0.044
				2021	1	0.427	-0.302	0.427	-0.418	0.295	
				2110	1	-0.171	-0.121			-0.118	-0.170
				2120	1	-0.165	-0.117			-0.114	-0.164
				2130	1	0.150	0.106			0.104	0.149
		14.00		0001	1/2	-0.178	0.002	-0.003	0.036	-0.026	
		13C	(11.72)				0.126	-0.178	0.174	-0.123	
		13N	11.87								
				0110	1/2	0.072				0.010	-0.008
							0.051			0.050	0.071
				2021	1	0.122	-0.086	0.122	-0.119	0.084	
				2110	1	0.003	-0.002			-0.002	-0.003
				2120		0	0.029			0.028	0.041
				21	1	0	0.040			0.039	0.056
		17.4		0001	1	0.017			0.004	-0.003	
							.012	-0.017	0.017	-0.012	
				0110	1/2	-0	-0.004			-0.062	0.049
							30			-0.294	-0.423
				2021	1	-0.166	31	-0.166	0.163	-0.115	
				2110	1	-0.166	- .31			-0.115	-0.165
				2120	1	0.323	0.22			0.224	0.321
				2130	1	0.159	0.11			0.110	0.158
		19.84		0001	1/2	-0.191	0.002	-0.003	0.039	-0.028	
							0.135	-0.191	0.167	-0.132	
				0110	1/2	0.320	0.003			0.046	-0.037
							0.226			0.222	0.318
				2021	1	0.465	-0.329	0.465	-0.455	0.322	
				2110	1	0.361	0.255			0.250	0.358
				2120	1	0.130	0.092			0.090	0.130
				2130	1	0.236	0.167			0.163	0.234
3/2	3/2	14.79		0001	1/2	0.797	-0.008	0.011	-0.163	0.116	
		13B	0.				-0.564	0.797	-0.780	0.551	
		13C	15.11								
		13N	15.07								
				2021	1	-0.315	0.223	-0.315	0.308	-0.218	
5/2	1/2	7.40		0110	1/2	-0.052				-0.007	0.006
		13C	7.55				-0.036			-0.036	-0.051
		13N	7.39								
				2021	1	-0.348	0.246	-0.348	0.341	-0.241	
				2110	1	0.155	0.110			0.107	0.154
				2120	1	0.293	0.207			0.203	0.291
				2130	1	-0.029	-0.020			-0.020	-0.028
		13.17		0110	1/2	-0.450	-0.005			-0.065	0.051
		13N	10.35				-0.318			-0.311	-0.447
				2021	1	0.052	-0.037	0.052	-0.051	0.036	
				2110	1	0.197	0.139			0.136	0.196
				2120	1	-0.245	-0.173			-0.170	-0.244
				2130	1	0.256	0.181			0.177	0.254
		17.17		0110	1/2	-0.143	-0.001			-0.021	0.016
							-0.101			-0.099	-0.142
				2021	1	0.191	-0.135	0.191	-0.187	0.132	
				2110	1	0.117	0.083			0.081	0.116
				2120	1	-0.381	-0.270			-0.264	-0.379
				2130	1	-0.200	-0.141			-0.138	-0.199
5/2	3/2	21.26		2021	1	0.295	-0.209	0.295	-0.288	0.204	
7/2	1/2	11.07		2021	1	0.194	-0.137	0.193	-0.189	0.134	
		13C	(11.97)								
		13N	10.36								
				2120	1	0.073	0.052			0.050	0.072
				2130	1	0.387	0.274			0.268	0.385
		19.50		2021	1	0.085	-0.060	0.085	-0.084	0.059	
				2120	1	0.135	0.096			0.094	0.134
				2130	1	-0.443	-0.314			-0.307	-0.441

TABLE 1 (Continued)

AI=12 JI= 0 TI= 0 TARGET 12C PICK UP

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
0	1	1.42		0001	1	1.656	-0.068	0.096	-0.404	0.285	
		10BE	0.		2		-1.169	1.654	-1.604	1.134	
		10B	1.74								
		10C	(0.)								
		12.48		0001	1	-0.062	0.003	-0.004	0.015	-0.011	
		10BE	6.18		2		0.044	-0.062	0.060	-0.043	
		10B	7.56								
		14.53		0001	1	0.297	-0.012	0.017	-0.072	0.051	
					2		-0.210	0.297	-0.288	0.204	
1	0	0.91		0110	1	-1.250	-0.051			-0.215	0.089
		10B	0.717		2		-0.882			-0.856	-1.247
				2110	1	-0.296	-0.209			-0.203	-0.295
		2.38		0110	1	0.544	0.022			0.094	-0.039
		10B	2.15		2		0.384			0.372	0.543
				2110	1	-0.741	-0.523			-0.507	-0.739
		6.19		0110	1	-0.055	-0.002			-0.009	0.004
		10B	5.18		2		-0.039			-0.038	-0.055
				2110	1	0.227	0.160			0.155	0.226
		9.98		0110	1	0.106	0.004			0.018	-0.008
		10B	(7.62)		2		0.075			0.073	0.106
				2110	1	-0.053	-0.037			-0.036	-0.053
		11.02		0110	1	-0.091	-0.004			-0.016	0.007
					2		-0.065			-0.063	-0.091
				2110	1	0.095	0.067			0.065	0.095
		17.29		0110	1	-0.223	-0.009			-0.038	0.016
					2		-0.157			-0.152	-0.222
				2110	1	0.076	0.054			0.052	0.076
1	0	19.62		0110	1	-0.373	-0.015			-0.064	0.027
					2		-0.263			-0.255	-0.372
				2110	1	0.274	0.193			0.187	0.273
2	0	3.34		2120	1	-0.851	-0.601			-0.582	-0.849
		10B	3.59								
		5.53		2120	1	-0.478	-0.338			-0.327	-0.477
		10B	(4.77)								
		10.27		2120	1	0.522	0.368			0.357	0.520
		10B	(5.92)								
		17.90		2120	1	0.391	0.276			0.268	0.390
2	1	5.58		2021	1	1.016	-0.717	1.014	-0.984	0.696	
		10BE	2.37								
		10B	5.17								
		10C	(3.36)								
		7.23		2021	1	2.114	-1.493	2.111	-2.047	1.447	
		10BE	7.55								
		10B	8.90								
		10.58		2021	1	-0.042	0.029	-0.042	0.040	-0.029	
		11.68		2021	1	-0.187	0.132	-0.187	0.181	-0.128	
		17.64		2021	1	0.007	-0.005	0.007	-0.007	0.005	
		19.18		2021	1	0.043	-0.030	0.043	-0.041	0.029	
		19.98		2021	1	-0.103	0.073	-0.103	0.100	-0.070	
3	0	0.		2130	1	-1.361	-0.961			-0.932	-1.358
		10B	0.								
		4.72		2130	1	-1.019	-0.719			-0.698	-1.016
		7.68		2130	1	1.263	0.892			0.865	1.260
		13.06		2130	1	0.177	0.125			0.121	0.177
		14.25		2130	1	-0.008	-0.006			-0.005	-0.008
		16.46		2130	1	0.001					0.001
		17.82		2130	1	-0.048	-0.034			-0.033	-0.048

AI=12 JI= 0 TI= 0 TARGET 12C STRIPPING

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
0	1	2.69		0001	1	0.773	0.017	-0.024	-0.126	0.089	
		14C	0.		2		-0.546	0.773	-0.762	0.539	
		14N	2.31								
		16.33		0001	1	-0.144	-0.003	0.004	0.024	-0.017	
		14C	6.58		2		0.102	-0.144	0.142	-0.101	
		14N	8.61								
1	0	0.		0110	1	-0.122	0.003			-0.014	0.019
		14N	0.		2		-0.086			-0.085	-0.121
				2110	1	0.596	0.421			0.416	0.589
		3.62		0110	1	0.586	-0.013			0.067	-0.092
		14N	3.94		2		0.414			0.408	0.578
				2110	1	0.025	0.018			0.018	0.025
		15.24		0110	1	-0.083	0.002			-0.010	0.013
		14N	(6.20)		2		-0.059			-0.058	-0.082
				2110	1	0.066	0.047			0.046	0.065
2	0	6.99		2120	1	0.311	0.220			0.217	0.307
		14N	7.03								
2	1	9.52		2021	1	0.226	-0.159	0.225	-0.222	0.157	
		14C	7.01								
		14N	9.17								
		17.88		2021	1	0.053	-0.037	0.052	-0.052	0.037	
		14N	(10.43)								
3	0	10.14		2130	1	0.174	0.123			0.122	0.172
		14N	6.44								

TABLE 1 (Continued)

AI=13 JI=1/2 TI=1/2 TARGET 13C PICK UP BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	1.71		0001	1	0.534	-0.005	0.008	-0.110	0.077	
		11B	2.124		2		-0.378	0.534	-0.523	0.370	
		11C	1.995								
				0110	1	0.063				0.009	-0.007
					2		0.044			0.043	0.062
				2110	1	-0.405	-0.286			-0.280	-0.402
		11.61		0001	1	-0.403	0.004	-0.006	0.083	-0.058	
					2		0.285	-0.403	0.394	-0.279	
				0110	1	0.208	0.002			0.030	-0.024
					2		0.147			0.144	0.207
				2110	1	0.082	0.058			0.056	0.081
		12.01		0001	1	-0.095		-0.001	0.020	-0.014	
					2		0.067	-0.095	0.093	-0.066	
				0110	1	-0.503	-0.005			-0.073	0.057
					2		-0.356			-0.348	-0.500
				2110	1	0.446	0.315			0.308	0.443
		16.82		0001	2	0.003	-0.002	0.003	-0.003	0.002	
				0110	1	-0.419	-0.004			-0.061	0.048
					2		-0.296			-0.290	-0.416
				2110	1	-0.206	-0.145			-0.142	-0.204
1/2	3/2	13.56		0001	1	-1.400	0.014	-0.020	0.287	-0.203	
		11BE	(0.32)		2		0.990	-1.400	1.369	-0.968	
		11B	13.02								
		11C	12.45								
3/2	1/2	0.		0110	1	0.067				0.010	-0.008
		11B	0.		2		0.048			0.046	0.067
		11C	0.								
				2021	1	0.300	-0.212	0.300	-0.293	0.207	
				2110	1	-0.218	-0.154			-0.151	-0.216
				2120	1	-0.561	-0.397			-0.388	-0.558
		5.39		0110	1	0.043				0.006	-0.005
		11B	(5.019)		2		0.030			0.030	0.043
		11C	4.794								
				2021	1	0.865	-0.612	0.865	-0.846	0.598	
				2110	1	0.148	0.104			0.102	0.147
				2120	1	0.004	0.002			0.002	0.003
		11.44		0110	1	0.195	0.002			0.028	-0.022
		11B	(10.25)		2		0.138			0.135	0.194
				2021	1	-0.236	0.167	-0.236	0.231	-0.163	
				2110	1	-0.166	-0.117			-0.115	-0.165
				2120	1	-0.345	-0.244			-0.238	-0.342
		13.36		0110	1	0.551	0.006			0.080	-0.063
					2		0.390			0.381	0.548
				2021	1	-0.065	0.046	-0.065	0.063	-0.045	
				2110	1	-0.125	-0.088			-0.087	-0.124
				2120	1	0.618	0.437			0.427	0.614
		13.44		0110	1	-0.063				-0.009	0.007
					2		-0.045			-0.044	-0.063
				2021	1	-0.877	0.620	-0.877	0.858	-0.607	
				2110	1	0.592	0.418			0.409	0.588
				2120	1	0.561	0.397			0.388	0.558
		15.05		0110	1	0.694	0.007			0.101	-0.079
					2		0.491			0.480	0.690
				2021	1	-0.351	0.248	-0.351	0.344	-0.243	
				2110	1	0.255	0.181			0.177	0.254
				2120	1	-0.119	-0.084			-0.083	-0.119
		16.77		0110	1	0.437	0.004			0.063	-0.050
					2		0.309			0.302	0.434
				2021	1	-0.608	0.430	-0.608	0.595	-0.421	
				2110	1	0.091	0.064			0.063	0.090
				2120	1	-0.004	-0.003			-0.003	-0.004
3/2	3/2	15.84		2021	1	-0.315	0.222	-0.314	0.308	-0.218	
		18.48		2021	1	-0.725	0.513	-0.725	0.709	-0.502	
5/2	1/2	4.35		2021	1	-0.740	0.523	-0.740	0.723	-0.512	
		11B	4.444								
		11C	4.305								
				2120	1	0.417	0.295			0.288	0.414
				2130	1	0.346	0.244			0.239	0.343
		8.10		2021	1	0.451	-0.319	0.451	-0.441	0.312	
		11B	(8.93)								
		11C	(8.42)								
				2120	1	0.515	0.364			0.356	0.512
				2130	1	-0.459	-0.324			-0.317	-0.456
		10.68		2021	1	-0.129	0.092	-0.129	0.127	-0.090	
		11B	(10.33)								
				2120	1	-0.208	-0.147			-0.144	-0.207
				2130	1	0.557	0.394			0.385	0.553
		14.40		2021	1	-0.014	0.010	-0.014	0.013	-0.009	
		11B	(11.0)								
				2120	1	-0.174	-0.123			-0.120	-0.173
				2130	1	0.767	0.542			0.530	0.762
		15.81		2021	1	0.641	-0.453	0.641	-0.626	0.443	
				2120	1	0.281	0.198			0.194	0.279
				2130	1	0.576	0.407			0.398	0.572
		17.10		2021	1	-0.222	0.157	-0.222	0.217	-0.154	
				2120	1	-0.153	-0.108			-0.106	-0.152
				2130	1	-0.061	-0.043			-0.042	-0.061
5/2	3/2	18.22		2021	1	0.343	-0.243	0.343	-0.336	0.237	
7/2	1/2	5.84		2130	1	-1.130	-0.799			-0.781	-1.123
		11B	6.743								
		11C	6.48								
		12.64		2130	1	0.066	0.047			0.046	0.066
		15.07		2130	1	-1.073	-0.759			-0.742	-1.066
		16.61		2130	1	0.270	0.191			0.187	0.269
		19.82		2130	1	0.069	0.049			0.048	0.069

TABLE 1 (Continued)

AI=13 JI=1/2 TI=1/2 TARGET 13C STRIPPING

BST=GNLSJT

JF	TF	E		LSJT	N	FPC	(T,N)	(T,P)	(HE3,N)	(HE3,P)	(HE4,D)
1/2	1/2	0.		0001	1	1.001	0.054	-0.077	-0.119	0.084	
		15N	0.		2		-0.705	0.998	-0.994	0.703	
		15O	0.								
				0110	1	0.051	-0.003			0.004	-0.010
					2		0.036			0.036	0.050
				2110	1	-0.865	-0.610			-0.608	-0.847
3/2	1/2	6.32		0110	1	0.387	-0.021			0.033	-0.078
		15N	6.32		2		0.273			0.272	0.379
				2021	1	0.300	-0.212	0.299	-0.298	0.211	
				2110	1	-0.066	-0.046			-0.046	-0.064
				2120	1	-0.392	-0.277			-0.275	-0.384

AI=14 JI= 1 TI= 0 TARGET 14N PICK UP

BST=GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
0	0	0.		0110	1	-0.122	0.003			-0.014	0.019
		12C	0.		2		-0.086			-0.085	-0.121
				2110	1	0.596	0.421			0.416	0.589
		13.47		0110	1	-0.127	0.003			-0.015	0.020
		12C	(7.653)		2		-0.090			-0.088	-0.125
				2110	1	0.577	0.408			0.402	0.570
1	0	12.44		0110	1	0.274	-0.006			0.032	-0.043
		12C	12.71		2		0.194			0.191	0.271
				2110	1	0.097	0.069			0.068	0.096
				2120	1	0.908	0.642			0.633	0.896
		19.18		0110	1	-0.357	0.008			-0.041	0.056
					2		-0.252			-0.249	-0.352
				2110	1	0.089	0.063			0.062	0.088
				2120	1	-0.085	-0.060			-0.059	-0.084
1	1	15.08		0001	1	0.182	0.004	-0.006	-0.030	0.021	
		12B	0.		2		-0.129	0.182	-0.180	0.127	
		12C	15.11								
		12N	0.								
				2021	1	0.376	-0.266	0.376	-0.371	0.262	
		19.50		0001	1	-1.176	-0.026	0.037	0.192	-0.135	
		12B	(5.00)		2		0.831	-1.175	1.160	-0.820	
				2021	1	0.244	-0.173	0.244	-0.241	0.170	
2	0	4.64		0110	1	0.458	-0.010			0.053	-0.072
		12C	4.439		2		0.324			0.319	0.452
				2110	1	0.370	0.262			0.258	0.365
				2120	1	0.583	0.412			0.406	0.575
				2130	1	0.030	0.021			0.021	0.030
		15.73		0110	1	-0.148	0.003			-0.017	0.023
		12C	(19.39)		2		-0.105			-0.103	-0.146
				2110	1	-0.240	-0.169			-0.167	-0.237
				2120	1	-0.604	-0.427			-0.421	-0.596
				2130	1	-0.623	-0.440			-0.434	-0.615
		18.12		0110	1	0.054	-0.001			0.006	-0.009
		12C	(19.39)		2		0.038			0.038	0.054
				2110	1	-0.294	-0.207			-0.205	-0.290
				2120	1	-0.340	-0.240			-0.237	-0.336
				2130	1	1.048	0.741			0.731	1.035
2	1	16.68		2021	1	-0.849	0.600	-0.849	0.838	-0.592	
		12B	0.953								
		12C	16.11								
		12N	(0.969)								
		20.03		2021	1	0.131	-0.092	0.131	-0.129	0.091	
		12B	3.76								
		12C	18.84								
3	0	17.25		2120	1	-0.145	-0.103			-0.101	-0.143
				2130	1	-0.790	-0.558			-0.551	-0.780
3	1	19.62		2021	1	-0.541	0.382	-0.541	0.534	-0.377	
4	0	13.49		2130	1	1.563	1.104			1.090	1.543
		12C	(14.08)								

AI=15 JI=1/2 TI=1/2 TARGET 15N PICK UP

BST=GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	0.		0001	1	1.001	0.054	-0.077	-0.119	0.084	
		13C	0.		2		-0.705	0.998	-0.994	0.703	
		13N	0.								
				0110	1	0.051	-0.003			0.004	-0.010
					2		0.036			0.036	0.050
				2110	1	-0.865	-0.610			-0.608	-0.847
		8.78		0001	1	0.018		-0.001	-0.002	0.001	
		13C	8.85		2		-0.012	0.018	-0.017	0.012	
		13N	8.92								
				0110	1	-0.489	0.027			-0.041	0.098
					2		-0.345			-0.344	-0.479
				2110	1	0.671	0.473			0.471	0.657

TABLE 1 (Continued)

AI=15 JI=1/2 TI=1/2 TARGET 15N PICK UP

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
1/2	1/2	13.81		0001	1	0.168	0.009	-0.013	-0.020	0.014	
		13C	(11.08)		2		-0.118	0.167	-0.167	0.118	
		13N	(10.78)								
				0110	1	0.618	-0.034			0.052	-0.124
					2		0.436			0.434	0.605
				2110	1	0.174	0.123			0.122	0.170
		17.41		0001	1	-0.347	-0.019	0.027	0.041	-0.029	
					2		0.244	-0.346	0.344	-0.243	
				0110	1	-0.158	0.009			-0.013	0.032
					2		-0.111			-0.111	-0.154
				2110	1	-0.211	-0.148			-0.148	-0.206
1/2	3/2	18.79		0001	1	-1.155	-0.063	0.089	0.137	-0.097	
					2		0.814	-1.151	1.146	-0.811	
3/2	1/2	3.59		0110	1	-0.594	0.032			-0.050	0.119
		13C	3.684		2		-0.419			-0.417	-0.582
		13N	3.509								
				2021	1	-0.601	0.424	-0.599	0.597	-0.422	
				2110	1	0.010	0.007			0.007	0.010
				2120	1	-0.374	-0.263			-0.262	-0.366
		10.43		0110	1	0.132	-0.007			0.011	-0.027
		13C	9.50		2		0.093			0.093	0.129
		13N	9.52								
				2021	1	0.180	-0.127	0.180	-0.179	0.127	
				2110	1	0.354	0.249			0.248	0.346
				2120	1	1.398	0.966			0.982	1.369
		14.00		0110	1	-1.159	0.083			-0.097	0.233
		13C	(11.72)		2		-0.817			-0.814	-1.135
		13N	11.87								
				2021	1	-0.711	0.501	-0.709	0.706	-0.499	
				2110	1	-0.173	-0.122			-0.121	-0.169
				2120	1	-0.244	-0.172			-0.171	-0.239
		17.44		0110	1	-0.205	0.011			-0.017	0.041
					2		-0.144			-0.144	-0.200
				2021	1	0.929	-0.655	0.927	-0.923	0.653	
				2110	1	0.303	0.214			0.213	0.297
				2120	1	-0.304	-0.214			-0.213	-0.298
		19.84		0110	1	0.147	-0.008			0.012	-0.030
					2		0.104			0.103	0.144
				2021	1	0.269	-0.189	0.268	-0.267	0.189	
				2110	1	0.475	0.335			0.333	0.465
				2120	1	-0.051	-0.036			-0.036	-0.050
3/2	3/2	14.79		2021	1	-0.249	0.176	-0.248	0.247	-0.175	
		13B	0.								
		13C	15.11								
		13N	15.07								
5/2	1/2	7.40		2021	1	1.496	-1.055	1.492	-1.485	1.050	
		13C	7.55								
		13N	7.39								
				2120	1	-0.714	-0.503			-0.501	-0.699
				2130	1	0.766	0.540			0.538	0.750
		13.17		2021	1	0.372	-0.262	0.371	-0.369	0.261	
		13N	10.35								
				2120	1	-0.733	-0.516			-0.514	-0.717
				2130	1	-0.613	-0.432			-0.430	-0.600
		17.17		2021	1	-0.869	0.613	-0.867	0.863	-0.610	
				2120	1	0.214	0.151			0.150	0.210
				2130	1	1.393	0.982			0.978	1.364
9/2	3/2	21.26		2021	1	-1.414	0.997	-1.410	1.404	-0.993	
7/2	1/2	11.07		2130	1	-1.889	-1.332			-1.326	-1.850
		13C	(11.97)								
		13N	10.36								
		19.50		2130	1	-0.657	-0.463			-0.461	-0.644

AI=16 JI= 0 TI= 0 TARGET 160 PICK UP

BST*GNLSJT

JF	TF	E		LSJT	N	FPC	(N,T)	(P,T)	(N,HE3)	(P,HE3)	(D,HE4)
0	1	2.69		0001	1	1.488	0.125	-0.177	-0.114	0.081	
		14C	0.		2		-1.045	1.477	-1.483	1.049	
		14N	2.31								
		16.33		0001	1	-0.887	-0.075	0.105	0.068	-0.048	
		14C	6.58		2		0.623	-0.880	0.884	-0.625	
		14N	8.61								
1	0	0.		0110	1	0.128	-0.011			0.007	-0.031
		14N	0.		2		0.090			0.090	0.124
				2110	1	-1.644	-1.154			-1.159	-1.594
		3.62		0110	1	-1.635	0.137			-0.089	0.390
		14N	3.94		2		-1.148			-1.153	-1.585
				2110	1	-0.286	-0.201			-0.201	-0.277
		15.24		0110	1	0.554	-0.047			0.030	-0.132
		14N	(6.20)		2		0.389			0.391	0.537
				2110	1	-0.462	-0.325			-0.326	-0.448

TABLE 2

AI	JI	TI	R	JF	TF	ENERGY	LSJT	POT	2BME
7	3/2	1/2	S	3/2	1/2	0.	0001	0.441	0.356
							0110	0.126	0.189
							2021	-0.316	-0.309
							2110	0.093	0.090
							2120	-0.144	-0.126
							2130	-0.625	-0.684
				5/2	1/2	2.43	0110	0.076	0.050
							2021	-0.712	-0.680
							2110	0.172	0.250
							2120	-0.191	-0.133
							2130	-0.517	-0.554
				7/2	1/2	6.66	2021	-0.488	-0.606
							2120	-0.206	-0.281
							2130	-0.798	-0.655
				3/2	3/2	14.39	0001	0.963	0.914
							2021	-0.253	-0.325
10	3	0	P	0	0	0.	2130	0.507	0.529
				2	0	2.90	0110	-0.021	0.053
							2110	-0.333	-0.299
							2120	0.597	0.662
							2130	-0.602	-0.643
				4	0	11.4	0110	-0.119	-0.041
							2110	0.549	0.509
							2120	-0.124	-0.133
							2130	0.181	-0.034
				2	1	16.63	2021	0.326	0.203

TABLE 3

AI	JI	TI	R	JF	TF	ENERGY	LSJT	C.-K.	BOYARKINA
7	3/2	1/2	P	3/2	1/2	0.	0001	0.942	0.913
							0110	-0.610	-0.734
							2021	0.520	0.598
							2110	0.173	0.010
							2120	-0.021	0.032
							2130	-0.675	-0.769
				1/2	1/2	2.6	0110	0.627	0.510
							2021	0.573	0.521
							2110	0.171	0.091
							2120	-0.462	-0.291
12	0	0	S	1	0	0.	0110	-0.122	-0.207
							2110	0.596	0.585
				0	1	2.31	0001	0.773	0.697
				1	0	3.94	0110	0.586	0.631
							2110	0.025	0.075
				3	0	6.44	2130	0.174	0.147
				2	0	7.03	2120	0.311	0.276
				0	1	8.61	0001	-0.144	-0.245
				2	1	9.17	2021	0.226	0.255
13	1/2	1/2	S	1/2	1/2	0.	0001	1.001	0.920
							0110	0.051	0.364
							2110	-0.865	-1.100
				3/2	1/2	6.32	0110	0.387	0.317
							2021	0.300	0.314
							2110	-0.066	0.084
							2120	-0.392	-0.166

TABLE 4

AI	JI	TI	R	JF	TF	ENERGY	LSJT	INT.	L-S	j-j
6	1	0	S	0	0	o.	0110	1.212	0.864	-0.065
							2110	0.114	0.	0.029
				2	0	2.90	0110	0.137	0.	-0.210
							2110	0.563	0.435	0.220
							2120	0.548	0.562	0.639
							2130	o.670	0.665	-0.346
				4	0	11.4	2130	0.186	0.	0.071
12	0	0	P	3	0	0.	2130	-1.361	-1.805	1.599
				1	0	0.717	0110	-1.250	0.	0.117
							211o	-0.296	0.	-0.052
				0	1	1.74	0001	1.656	1.809	-1.413
				1	0	2.15	0110	0.544	0.	0.245
							2110	-0.741	-1.182	-0.109
				2	0	3.59	2120	-0.851	-1.525	0.
13	1/2	1/2	P	3/2	1/2	0.	0110	0.067	-0.146	-0.090
							2021	0.300	1.018	-0.117
							2110	-0.218	-0.156	-0.163
							2120	-0.561	-0.467	0.355
				1/2	1/2	2.124	0001	0.534	0.644	0.421
							0110	0.063	0.051	-0.002
							2110	-0.405	-0.441	-0.050
				5/2	1/2	4.44	2021	-0.740	-0.894	-0.264
							2120	0.417	0.241	0.263
							2130	0.346	0.226	-0.266
				3/2	1/2	5.019	0110	0.043	0.	0.391
							2021	0.865	1.094	0.202
							2110	0.148	0.222	-0.442
							2120	0.004	0.074	-0.292
				7/2	1/2	6.743	2130	-1.130	-1.300	-0.493

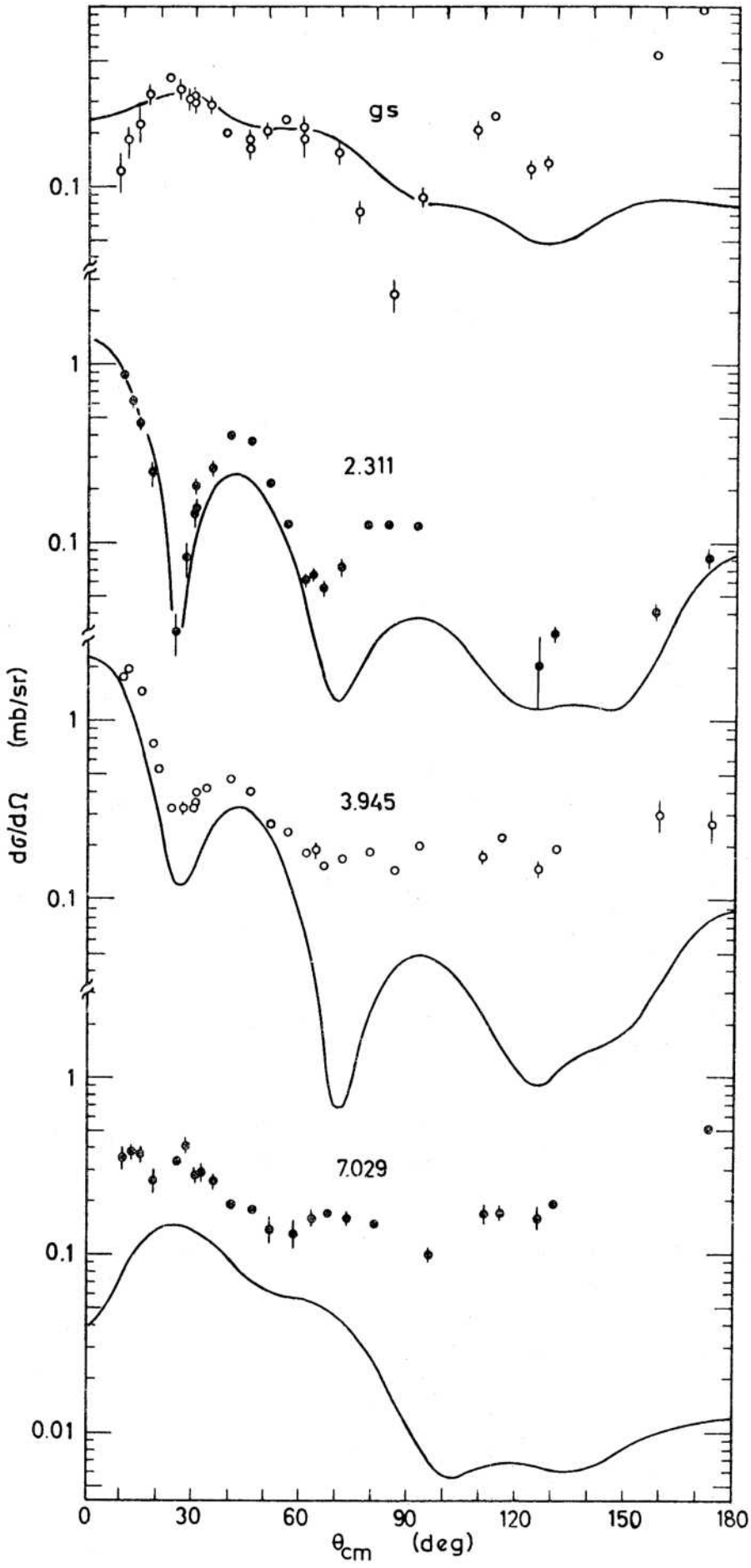
gs
2.311
3.945
7.029
dσ/dΩ (mb/sr)
θcm (deg)
0.1
1
0.01
0
30
60
90
120
150
180

Fig. 1

FIGURE CAPTION

Fig. 1- Comparison of DWBA calculations using intermediate coupling G_{NLSJT} factors with experimental angular distributions for the $^{12}C(^{3}He,p)^{14}N$ reaction [12].

CAPTIONS TO THE TABLES

Table 1- The intermediate G_{NLSJT} nuclear structure factors for two particle transfer in the p-shell.

Table 2- Comparison of some G_{NLSJT} factors obtained for different sets of intermediate coupling wave functions [7]. (S=stripping, P=pick-up).

Table 3- Comparison of some G_{NLSJT} factors reported in table 1 with the corresponding structure factors obtained using Boyarkina's wave functions [13,14] (S=stripping, P=pick-up).

Table 4- Comparison of some structure factors obtained for intermediate L-S and j-j coupling (S=stripping, P=pick-up).

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