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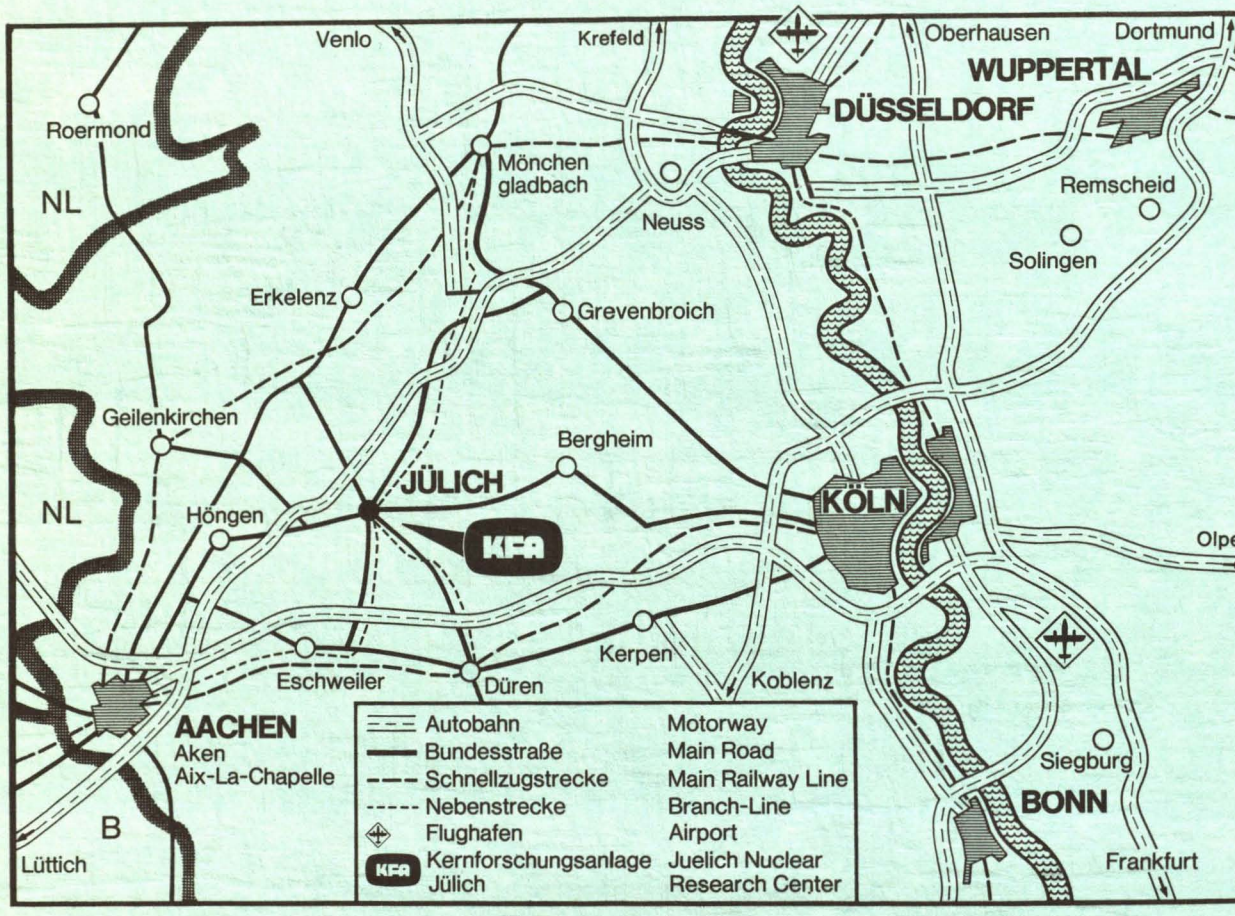

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Oscillator Matrix Elements from Nucleon-Nucleon Phase Shifts with Inclusion of Short-Range Correlations

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Abstract: Methods which derive oscillator matrix elements directly from the nucleon-nucleon phase shifts usually use a zero order potential for a DWBA type approximation. Such a method is extended to include also hard-and soft-core potentials as zero order approach. The influence of the resulting correction terms is studied in Brueckner-Hartree-Fock calculations for ^{16}O. Although realistic potentials (Hamada-Johnstone and Reid soft core) are used as reference potentials in DWBA, the effect of these corrections turns out not to be negligible, yielding, about 0.7 MeV per nucleon additional binding energy in ^{16}O.

1. Introduction

For a microscopic understanding of the structure of nuclei it is indispensible to start from a "realistic" nucleon-nucleon (NN) interaction. Since the field theory is not yet in a stage to provide a precise description, some methods have been developed, which try to calculate the matrix elements of the interaction directly from the phase shifts for the NN scattering. Among these attempts the methods of Elliott et al.[1-3], often referred to as the Sussex matrix elements, and the method of Faessler and coworkers[4,5] seem to be the most promising ones. Both of the methods split the exact interaction V into $V = \hat{V} + (V-\hat{V})$, with $\hat{V}$ a suitable chosen auxiliary potential and calculate the matrix elements for the correction $(V-\hat{V})$ in DWBA. Originally[1] the Sussex group used a cut-off oscillator potential $\hat{V}$ as a zero order approximation to V. Since the resulting matrix elements did not yield the correct saturation property[2], effects of the short range repulsion were considered in a later paper[3], by adding in a simple form a repulsive core $\hat{V}_c$ to the auxiliary potential $\hat{V}$. In order to sum up the ladder diagrams, which was necessary due to the strong repulsive $\hat{V}_c$, they solved the Bethe-Goldstone equation rather approximatively and for $\hat{V}_c$ only.

Compared to the Sussex approach the method introduced in ref. 4) has the advantage, that it allows any kind of velocity-independent soft-core potential to be chosen for the auxiliary potential $\hat{V}$. This flexibility to consider "realistic" potentials $\hat{V}$ should be important, because the DWBA correction in $(V-\hat{V})$ only takes care of the correct on-shell behaviour of the interaction. It is the aim of the present paper to extend the method of ref. 4)

to consider also potentials $\hat{V}$ with strong short range components as auxiliary potentials. For the calculations the Hamada-Johnstone[5] and the Reid soft-core potential[6] are used which were fitted to reproduce the experimental NN phase shifts. Therefore, the DWBA should be a rather good approximation to treat $(V-\hat{V})$. The difference of the matrix elements for $\hat{V}$ compared to those of the exact interaction V will partially be caused by the improved values for the experimental phase shifts[7]. Therefore, the calculations also give some impression on the dependency of nuclear structure calculations on an accurate determination of the NN phase shifts.

The details of the calculation of matrix elements for the NN interaction directly from the phase shifts of NN scattering are outlined in sect. 2. In sect. 3 some features of these matrix elements are discussed. The results of Brueckner-Hartree-Fock calculation are presented as an example for the use of these interactions in sect. 5.

2. Calculation of the Matrix Elements

The matrix elements of an NN interaction V which contains strong short range components, calculated for a set of independent single particle wave functions cannot be used directly in a nuclear structure calculation; they may even diverge, when an infinite hard core is assumed. To avoid these infinities one has to consider the effects of the strong short range correlations in lowest order already. Therefore, one calculates the matrix elements for correlated two particle wave functions, or defines an effective interaction G by the equation

$$\langle ab|G|cd\rangle = \langle ab|V|\Psi_{cd}\rangle . \tag{2.1}$$

In this equation $|ab\rangle$ and $|cd\rangle$ are products of independent single particle wave functions, such as oscillator wave functions, while $|\Psi_{cd}\rangle$ contains also the two particle correlations for the single particle states c and d. In the framework of Brueckner theory this correlated wave function is written as

$$|\Psi_{cd}\rangle = |cd\rangle + \frac{Q}{W-H_o} V |\Psi_{cd}\rangle . \tag{2.2}$$

Following eq. (2.1) this corresponds to a definition of an effective interaction G by the Bethe-Goldstone equation:

$$G = V + V \frac{Q}{W-H_o} G \tag{2.3}$$

In these eqs. (2.2) and (2.3), the Pauli operator Q is defined by $Q\,|ab\rangle = 0$, if a or b are occupied in the Hartree-Fock wave

function for the considered nucleus, and $Q\,|ab\rangle = |ab\rangle$ if both a and b are unoccupied states. The unperturbed Hamilton operator H_o refers only to the two nucleons involved, occupying particle states above the Fermi surface. The starting energy W can be regarded as a parameter, because its value is defined self-consistently from nuclear structure calculation.

Since, normally, an NN potential V only depends on the relative coordinate of the pair of interacting nucleus, it is natural to perform a transformation to relative and c.m. coordinates. To simplify eqs. (2.2) and (2.3) we assume, in a first step, H_o to be the Hamiltonian of a harmonic oscillator shifted by a constant C, and define a Pauli operator Q_o in a basis of oscillator states $|a\rangle$, $|b\rangle$ by

$$Q_o|ab\rangle = \begin{cases} 0 \text{ for } 2n_a+\ell_a+2n_b+\ell_b \leq N_o \\ |ab\rangle \quad \text{else} \end{cases} \tag{2.4}$$

with N_o defined appropriately for the considered nucleus. This Pauli operator has been introduced by Eden and Emery[9]. It has the advantage to be diagonal in the relative and c.m. and in the laboratory representation of the harmonic oscillator states. Therefore, the Bethe-Goldstone equation (2.3) and eq. (2.2) can be solved in relative coordinates, and the resulting G matrix elements can be expressed in terms of the relative matrix elements which are diagonal in the c.m. quantum numbers. Its values, however, depend on the c.m. quantum number $N = (2N_{cm}+L_{cm})$. For a more refined calculation this G matrix may be used as a reference G matrix and, its difference from the selfconsistent G can be treated in a perturbative expansion (see also sect. 4). A method

for the solution of the Bethe-Goldstone eq. (2.3) using these approximations has been developed by Becker, MacKellar and Morris[10] and is also used here to calculate the G matrix elements for the Hamada-Johnstone or Reid potential which are used as axiliary potentials $\hat{V}$. For these potentials $\hat{V}$, the method also yields correlated wave functions $\hat{\Psi}$:

$$|\hat{\psi}^{N\ W}_{nJ}> = |R_{nJ}> + \frac{Q_o}{W-H_o}\ \hat{V}\ |\hat{\psi}^{N\ W}_{nJ}>. \tag{2.5}$$

In this eq. the index J denotes the quantum nubmers of the different scattering channels, i.e. J = (total angular momentum, relativ orbital angular momentum, spin of the two interacting nuclei). To simplify the notation we have restricted the formulation to central forces only. The extension to tensor forces can easily be done using the corresponding formulae of ref. 10) and ref. 5), respectively. The wave function R_{nJ} are the oscillator functions for the relative motion of the two particles, and the upper indices N and W remind that the correlated wave functions are different for different c.m. quantum numbers $N = (2N_{cm}+L_{cm})$ and starting energies W.

Our aim is to calculate the G matrix for the exact NN interaction V:

$$<R_{n'J}|G(N,W)|R_{nJ}> = <R_{n'J}|V|\psi^{NW}_{nJ}> \tag{2.6}$$

$$\simeq <R_{n'J}|\hat{V}|\hat{\psi}^{NW}_{nJ}> + <R_{n'J}|V-\hat{V}|\hat{\psi}^{NW}_{nJ}> \tag{2.7}$$

Going from (2.6) to (2.7) the correlated wave function Ψ for the

unknown correct interaction V is replaced by $\hat{\Psi}$, an approximation which corresponds to the DWBA. Thereby the first term of eq. (2.7) is the G matrix $\hat{G}$ for the auxiliary potential. To calculate the correction term in eq. (2.7) the following integral representation for the difference of the phase shifts for the potential V and $\hat{V}$ is used:

$$k \sin(\delta_J(k)-\hat{\delta}_J(k)) \simeq -\frac{m}{\hbar^2}\int_0^\infty dr\,(V(r)-\hat{V}(r))\,\hat{U}_J^2(k,r). \quad (2.8)$$

This approximation is obtained in DWBA[4] and is valid only if the difference $(\delta(k)-\hat{\delta}(k))$ is small over the whole energy range. The $\hat{U}_J(k,r)$ are the scattering wave functions for the potential $\hat{V}$. With the solution $F^{NW}_{n'nJ}(k)$ of the integral equation

$$r^2\,R_{n'J}(r)\,\hat{\Psi}^{NW}_{nJ}(r) = \int_0^\infty dk\,\frac{1}{k}\,F^{NW}_{n'nJ}(k)\,\hat{U}^2_J(k,r) \quad (2.9)$$

the DWBA correction term in eq. (2.7) can be calculated.

$$\langle R_{n'J}|V-\hat{V}|\hat{\Psi}^{NW}_{nJ}\rangle = -\frac{\hbar^2}{m}\int_0^\infty dk\,F^{NW}_{n'nJ}(k)\,\mathrm{sind}(\delta_J(k)-\hat{\delta}_J(k)). \quad (2.10)$$

To calculate the corrected matrix elements (2.6) one has to follow the procedure: One solves the Bethe-Goldstone eq. (2.3) for the auxiliary potential $\hat{V}$. This yields the first term of eq. (2.7) and the correlated wave functions $\hat{\Psi}$. These correlated wave functions enter the integral equation (2.9) which is solved numerically for each combination nn', for each scattering channel J, for each c.m. quantum number ($N=2N_{cm}+L_{cm}$) and for each considered value for the starting energy separately. The solutions $F^{NW}_{n'nJ}$, obtained from this integral equation, are needed to calculate the matrix element (2.10) which is the DWBA correction term in eq. (2.7).

3. Results for the Matrix Elements

Using the method described in sect. 2 the relative matrix elements of the NN interaction were calculated for the oscillator wave functions with an oscillator length b = 1.76 fm. For the auxiliary potential $\hat{V}$ the Hamada-Johnstone[6] (HJ) and the Reid soft-core[7] potentials (RSC) were used. The NN phase shifts, for which these interactions are corrected, were taken from the analysis of the Livermore group (table VII of ref. 8). To obtain the $\hat{G}$ matrix elements and the correlated two particle wave functions $\hat{\Psi}$ the Bethe-Goldstone equation was solved for an Eden-Emery-Pauli operator Q_o defined in eq. (2.4) with $N_o = 5$. This choice has been found to be appropriate for light nuclei[10] such as ^{16}O. Due to numerical reasons the calculation of the DWBA correction terms for the tensor matrix elements connecting different relative orbital angular momenta is rather unstable and not very reliable[5]. Therefore, we followed ref. 5) and used, in the nuclear structure calculation (sect. 4), the tensor matrix elements nondiagonal in ℓ, of the auxiliary potentials. Using the same argumentation we also neglected, in calculating the correction term (2.10), the components of the correlated triplet wave functions which have a different orbital angular momentum than the uncorrelated relative wave function. Those components originate from the tensor part of the NN interaction (eq. 2.5), but their amplitudes are normally small compared to the leading components[10]. Therefore, their contribution to the correction term turned out to be small.

Some of the resulting G matrix elements using the HJ potential as bare interaction $\hat{V}$ are given in tables 1-3. In these tables the upper number of each pair of matrix elements gives

the result for the $\hat{G}$ matrix of the auxiliary potential $\hat{V}$ (first term in eq. 2.7) while the second value also contains the DWBA correction for the NN phase shifts. A complete list of all those matrix elements with $2n+\ell+2N_{cm}+L_{cm} \leq 8$ for four different values of the starting energy is given in the appendix.

Table 1 contains matrix elements $\langle nJ|G(N,W)|n'J\rangle$ for $nn' \leq 3$ and $J = {}^1S_0$, ${}^3S_1$, ${}^1P_1$, ${}^3P_0$, ${}^3P_1$, ${}^3P_2$, ${}^1D_2$, ${}^3D_1$, ${}^3D_2$ and ${}^3D_3$. The c.m. quantum numbers are $2N_{cm} + L_{cm} = 0$ and the starting energy considered for this table is W = - 8 MeV. Comparing the phase shift corrected matrix elements with the corresponding bare G it turns out, that the corrections are small enough to rely on the DWBA but they are not negligilble. The absolute values for the phase shift correction terms are especially large and attractive for $n,n' > 0$ in the ${}^1S_0$ channel. This may be traced back to the new less negative values for the experimental ${}^1S_0$ np phase shifts at high energies. But compared to the values of the matrix elements, the correction terms are large also in other channels, and in some cases, they even cause a change of sign for the total value.

In table 2, the ${}^1S_0$ and ${}^3S_1$ matrix elements, calculated for different starting energies, are compared. For the ${}^3S_1$ case we find a strong dependence on the starting energy for the total matrix element. But even in this case the correction terms vary only slightly with W. The dependence of the correction term on the c.m. quantum numbers turns out to be weak as can be seen from table 3.

Similar features can also be observed when RSC is used for the auxiliary potential $\hat{V}$. Therefore, matrix elements, with and without the phase shift correction term, are given in table 4 for

only one set of c.m. quantum numbers ($2N_{cm}+L_{cm}=0$) and one value for the starting energy W = - 8 MeV. (A complete list is contained in the appendix. Comparing these results to the corresponding HJ matrix elements in table 1 one can see that the correction term yields similar values. The differences between the G matrix elements originating from the two NN potentials (HJ and RSC) are of the same order of magnitude as the phase shift corrections. This indicates the importance of the "off-shell" properties of the NN interaction in calculating the G matrix elements.

4. Brueckner Hartree Fock

In order to study the influence of the phase shift correction to the NN interaction in a nuclear structure calculation some Brueckner-Hartree-Fock (BHF) calculations were performed for ^{16}O using the matrix elements derived in sect. 2 and discussed in sect. 3 of this paper. To improve the effective interaction G for a more realistic Pauli operator Q instead of the Eden-Emery-Pauli operator Q_o in the Bethe-Goldstone equation (2.3) the reference spectrum method equation was used:

$$G^{sc} = G + G \left(\frac{Q}{e} - \frac{Q_o}{e_o}\right) G^{sc} \tag{4.1}$$

$$\simeq G + G \left(\frac{Q}{e} - \frac{Q_o}{e_o}\right) G \tag{4.2}$$

In this equation G denotes the solution of the Bethe-Goldstone equation using the Pauli operator Q_o (eq. 2.4) and G^{sc} represents the self-consistent solution calculated with the self-consistent Pauli operator Q. Since already the operator Q_o is a satisfactory Pauli operator for ^{16}O, the approximation in going from (4.1) to (4.2) and replacing G^{sc} by G on the right hand side should be a rather good approximation. Although this Pauli correction can be done for the operator Q defined in terms of the self-consistent BHF wave functions[11], we define it in the present work by the corresponding oscillator wave function[10,12,13]. This reduces the amount of computer time considerably and has been used earlier for BHF calculations[12,13]. For the Hamiltonian of the intermediate particle states (H_o in eq. 2.3) the spectrum of a harmonic oscillator, shifted by a constant C = 30 MeV, was assumed. After

the Pauli correction (4.2), the Coulomb potential was added for the interaction between the protons. The self-consistent BHF single particle wave functions were expanded in an oscillator basis (b = 1.76 fm) upto $2n+\ell \leq 6$.

Beside the regular choice for the BHF single particle potential, the Renormalized BHF (RBHF) concept[13] has been applied defining self-consistent partial occupation probabilities for the hole states by

$$P_i = \left[1 - \sum_{j<F} \langle ij | \frac{\partial G^{sc}(W)}{\partial W} | ij \rangle P_j\right]^{-1} \qquad (4.3)$$

Table 5 contains the single particle energies and the occupation probabilities for the hole states, the total binding energy per nucleon, and the radii of the charge distribution for both BHF and RBHF calculations for ^{16}O. For the NN interaction the HJ potential, with and without the phase shift correction term of eq. (2.10) has been used. The DWBA correction yields more attraction. The absolute values for the single particle energies are increased by about 1.5 MeV. On the other hand, the phase shift corrected NN interaction leads to a set of self-consistent BHF states which give more kinetic energy. Therefore, the total binding energies per nucleon increase only by about 0.7 MeV and simultaneously the radii of the charge distributions decrease by about 0.02 fm. The same trends are found also with an intermediate particle spectrum in the Bethe-Goldstone equation (H_o in eq. (2.3)) shifted down by about 10 MeV more. The values for the occupation probabilities P_i in RBHF are practically unchanged by the inclusion of the phase shift corrections. This reflects the fact that, these corrections are nearly independent of the value of

starting energy (see sect. 3).

The values in table 6 were calculated using the RSC potential. It may be noticed that the influence of the phase shift correction in this case is similar to the one discussed for the HJ potential. It means that the inclusion of the DWBA correction discussed in sect. 2 and 3, gives slight improvement in the BHF binding energies of finite nuclei.

5. Summary

In the present paper a method has been developed to derive the matrix elements of the effective NN interaction directly from the phase shifts of NN scattering using the DWBA and realistic hard- or soft-core auxiliary potentials. Although the auxiliary potentials (such as Hamada-Johnstone, or the Reid soft-core) have been fitted quite carefully to the scattering data, the DWBA correction is not negligible. This may, at least partially, be understood as a consequence of the improvement especially of the pn scattering phase shifts[8]. BHF calculations were performed for ^{16}O in order to study the influence of the phase shift correction terms in finite nuclei. The value for the binding energy was improved by about 0.7 MeV per nucleon. But the corrections lead, simultaneously to smaller radii of the charge distribution and, therefore, a real improvement of the BHF description of finite nuclei could not be obtained. It seems, however, to be worthwhile to study the influence of the phase shift corrections to the NN interaction also in other nuclear structure calculations.

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Table captions

Table 1: Relative oscillator matrix elements $\langle nJ|G|n'J\rangle$ (MeV) of the effective NN interaction G for the different channels J = $^1S_0$, $^3S_1$ ... . For each considered matrix element the upper number gives the value of the solution of the Bethe-Goldstone equation for the HJ potential. The numbers below also contain the phase shift correction term (eq. 2.10). In calculating the correlated wave functions (eq. 2.5) for this table cm quantum numbers $2N_{cm}+L_{cm}$ = 0 and a starting energy W = -8 MeV were considered. The oscillator length for the wave function is b = 1.76 fm. The experimental phase shifts have been taken from the analysis of the Livermore group (tabel VII of ref. 8). A complete list of matrix elements is given in the appendix.

Table 2: Relative G matrix elements considering different values for the starting energy (W = -68, -8, 52 MeV). Further details see table 1.

Table 3: Relative G matrix elements for different c.m. quantum numbers ($2N_{cm}+L_{cm}$ = 0, 1, 2). Further details see table 1.

Table 4: Relative matrix elements for the RSC beeing used as auxiliary potential in DWBA. Further details see table 1.

Table 5: BHF and RBHF calculations on ^{16}O. The values for the single particle energies ε (MeV) and the self-consistent

occupation probabilities P defined by eq. (4.3) in RBHF are given for the proton states. The binding energies per nucleon (BE/A) and the radii of the charge distributions (R_{ch}) are corrected for c.m. motion. For the NN interaction the HJ potential including (+corr.) and not including the phase shift corrections is used.

Table 6: BHF and RBHF calculations on ^{16}O. The details are the same as for table 5. Instead of the HJ the RSC has been used for the NN interaction.

Table 1:

n n'	$^1S_0$	$^3S_1$	$^1P_1$	$^3P_0$	$^3P_1$	$^3P_2$	$^1D_2$	$^3D_1$	$^3D_2$	$^3D_3$
0 0	-5.905	-8.009	1.733	-1.737	1.871	-0.828	-0.491	1.210	-2.071	0.032
	-6.186	-8.342	1.820	-1.856	1.888	-0.904	-0.476	0.808	-2.212	-0.050
0 1	-4.674	-6.711	1.844	-1.167	2.018	-1.116	-0.546	1.187	-2.094	0.011
	-5.212	-6.744	2.174	-1.462	2.085	-1.136	-0.529	0.770	-2.248	-0.035
0 2	-3.108	-4.803	1.972	-0.459	2.013	-1.254	-0.545	1.012	-1.868	-0.012
	-3.989	-4.715	2.419	-0.864	2.150	-1.207	-0.526	0.589	-2.013	0.001
0 3	-1.562	-2.840	2.151	0.175	1.987	-1.307	-0.530	0.826	-1.607	-0.029
	-2.836	-2.517	2.583	-0.267	2.200	-1.197	-0.503	0.410	-1.758	0.051
1 1	-3.972	-5.899	2.691	-1.027	2.684	-1.519	-0.783	1.560	-2.836	0.000
	-4.988	-5.501	3.124	-1.453	2.846	-1.490	-0.770	1.186	-2.967	-0.025
1 2	-2.539	-4.109	3.081	-0.379	2.896	-1.733	-0.862	1.519	-2.868	-0.015
	-3.945	-3.635	3.491	-0.862	3.154	-1.641	-0.838	1.123	-3.005	0.015
1 3	-0.978	-2.132	3.362	0.363	2.953	-1.826	-0.876	1.326	-2.629	-0.030
	-2.717	-1.616	3.744	-0.124	3.275	-1.673	-0.849	0.950	-2.784	0.046
2 2	-1.431	-2.684	3.840	0.040	3.391	-1.997	-1.055	1.702	-3.326	-0.020
	-2.518	-2.291	4.084	-0.268	3.584	-1.922	-1.038	1.434	-3.439	0.013
2 3	-0.052	-0.938	4.311	0.692	3.614	-2.122	-1.137	1.618	-3.310	-0.025
	-1.292	-0.459	4.504	0.402	3.842	-2.008	-1.114	1.365	-3.427	0.035
3 3	1.063	0.473	4.998	1.187	4.027	-2.273	-1.302	1.677	-3.588	-0.020
	0.320	0.837	5.025	1.042	4.176	-2.200	-1.275	1.506	-3.681	0.054

Table 2:

	$^1S_0$			$^3S_1$		
n n'	W= -68	-8	52	-68	-8	52
0 0	-5.316	-5.905	-6.524	-5.851	-8.009	-11.729
	-5.564	-6.186	-6.899	-6.202	-8.342	-12.026
0 1	-3.984	-4.674	-5.403	-4.458	-6.711	-10.442
	-4.457	-5.212	-6.123	-4.528	-6.744	-10.379
0 2	-2.371	-3.108	-3.881	-2.669	-4.803	-8.161
	-3.162	-3.989	-5.023	-2.623	-4.715	-7.959
1 1	-3.152	-3.972	-4.823	-3.502	-5.899	-9.692
	-4.081	-4.988	-6.075	-3.140	-5.501	-9.198
1 2	-1.658	-2.539	-3.451	-1.802	-4.109	-7.584
	-2.946	-3.945	-5.179	-1.384	-3.635	-6.964
2 2	-0.471	-1.431	-2.413	-0.414	-2.684	-5.937
	-1.606	-2.518	-3.418	-0.010	-2.291	-5.564

Table 3:

	$^1S_0$			$^3S_1$		
	$2N_{cm}+L_{cm}=0$	1	2	0	1	2
0 0	-5.905	-5.769	-5.698	-8.009	-7.450	-7.542
	-6.186	-6.040	-5.961	-8.342	-7.788	-7.881
0 1	-4.674	-4.515	-4.408	-6.711	-6.135	-6.042
	-5.212	-5.034	-4.910	-6.744	-6.179	-6.092
0 2	-3.108	-2.941	-2.798	-4.803	-4.266	-4.027
	-3.989	-3.795	-3.629	-4.715	-4.190	-3.957
1 1	-3.972	-3.784	-3.637	-5.899	-5.293	-5.051
	-4.988	-4.775	-4.289	-5.501	-4.906	-4.776
1 2	-2.539	-2.339	-2.160	-4.109	-3.535	-3.187
	-3.945	-3.710	-3.070	-3.635	-3.077	-2.906
2 2	-1.431	-1.213	-0.562	-2.684	-2.126	-1.715
	-2.518	-2.313	-1.696	-2.291	-1.730	-1.436

Table 4:

n n'	$^1S_0$	$^3S_1$	$^1P_1$	$^3P_0$	$^3P_1$	$^3P_2$	$^1D_2$	$^3D_1$	$^3D_2$	$^3D_3$
0 0	-5.990	-7.146	1.266	-1.796	1.863	-0.906	-0.462	1.273	-2.299	-0.074
	-6.299	-7.434	1.506	-1.737	1.800	-0.902	-0.481	1.070	-2.154	-0.867
0 1	-4.849	-5.775	1.929	-1.275	2.112	-1.188	-0.512	1.181	-2.304	-0.097
	-5.487	-5.513	2.030	-1.366	2.053	-1.146	-0.540	0.976	-2.185	-0.403
0 2	-3.347	-3.697	2.496	-0.570	2.163	-1.302	-0.511	0.933	-2.024	-0.099
	-4.400	-2.967	2.230	-0.760	2.103	-1.241	-0.543	0.728	-1.967	0.161
0 3	-1.859	-1.509	2.907	0.100	2.140	-1.325	-0.494	0.695	-1.712	-0.087
	-3.315	-0.548	2.375	-0.157	2.136	-1.257	-0.517	0.467	-1.724	0.391
1 1	-4.140	-4.005	3.012	-1.120	2.808	-1.584	-0.734	1.503	-3.091	-0.130
	-5.372	-3.481	2.965	-1.318	2.800	-1.530	-0.763	1.322	-3.020	-0.155
1 2	-2.777	-1.768	3.682	-0.431	3.032	-1.774	-0.803	1.397	-3.103	-0.131
	-4.389	-1.100	3.334	-0.691	3.080	-1.704	-0.826	1.181	-3.058	-0.070
1 3	-1.307	0.572	4.158	0.382	3.071	-1.839	-0.807	1.156	-2.825	-0.116
	-3.221	1.371	3.506	0.079	3.192	-1.756	-0.811	0.914	-2.845	-0.081
2 2	-1.683	0.853	4.516	0.101	3.487	-2.019	-0.974	1.541	-3.592	-0.135
	-2.886	1.257	4.242	-0.074	3.559	-1.972	-0.977	1.367	-3.595	-0.217
2 3	-0.411	3.140	5.044	0.861	3.656	-2.127	-1.036	1.433	-3.576	-0.117
	-1.784	3.596	4.633	0.660	3.793	-2.076	-1.026	1.231	-3.603	-0.136
3 3	0.663	5.896	5.663	1.536	3.978	-2.271	-1.169	1.491	-3.900	-0.097
	-0.169	6.151	5.458	1.406	4.113	-2.249	-1.158	1.312	-3.923	-0.048

Table 5:

		BHF	BHF + Corr.	RBHF	RBHF + Corr.	exp.
$\pi S_{1/2}$	ε [MeV]	-41.68	-43.65	-34.48	-36.29	-40±8
	P	1.0	1.0	0.78	0.78	
$\pi P_{3/2}$	ε [MeV]	-20.48	-22.03	-15.00	-16.34	-18.4
	P	1.0	1.0	0.85	0.84	
$\pi P_{1/2}$	ε [MeV]	-17.00	-18.77	-12.69	-14.18	-12.1
	P	1.0	1.0	0.85	0.85	
BE/A	[MeV]	4.35	5.02	5.51	6.24	7.98
R_{cm}	[fm]	2.445	2.421	2.562	2.529	2.7±0.1

Table 6:

		BHF	BHF + Corr.	RBHF	RBHF + Corr.	exp.
$\pi S_{1/2}$	ε [MeV]	-36.68	-38.25	-28.99	-31.37	-40±8
	P	1.0	1.0	0.83	0.82	
$\pi P_{3/2}$	ε [MeV]	-20.07	-21.41	-15.25	-16.41	-18.4
	P	1.0	1.0	0.82	0.81	
$\pi P_{1/2}$	ε [MeV]	-17.25	-18.20	-13.11	-13.90	-12.1
	P	1.0	1.0	0.82	0.82	
BE/A	[MeV]	4.31	4.86	5.43	6.04	7.98
R_{cm}	[fm]	2.527	2.512	2.615	2.595	2.7±0.1

Appendix

The tables of the appendix contain a list of relative oscillator matrix elements $\langle nJ|G(N,W)|n'J\rangle$ [MeV] of the effective NN interaction G for the different channels J = $^1S_0$, $^3S_1$, $^1P_1$, $^3P_0$, $^3P_1$, $^3P_2$, $^1D_2$, $^3D_1$, $^3D_2$ and $^3D_3$. For each considered matrix element the upper number gives the value of the solution of the Bethe-Goldstone equation for the considered NN potential V, using an Eden-Emery-Pauli operator. ($Q|ab\rangle = 0$ for $2n_a + \ell_a + 2n_b + \ell_b \leq 5$). The numbers below also contain the phase shift correction term (eq. 2.10). For the bare NN potential the Hamada-Johnstone potential (table 1-36) and the Reid-soft-core potential (table 37-72) are used. In calculating the correlated wave functions for the different tables different cm quantum numbers ($N = 2N_{cm} + \ell_{cm} = 0, 1, 2, \ldots 8$) and starting energies (W = -68, -8, 52, 82 MeV) are used. All matrix elements with $2N_{cm} + \ell_{cm} + 2n + \ell \leq 8$ are given. The oscillator length for the wave function is b = 1.76 fm.

TABEL 1 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.316	-5.851	1.822	-1.698	1.917	-0.793	-0.489	1.220	-2.052	0.059
		-5.564	-6.202	1.888	-1.798	1.932	-0.867	-0.475	0.844	-2.182	-0.019
0	1	-3.984	-4.458	1.980	-1.108	2.089	-1.067	-0.541	1.204	-2.062	0.047
		-4.457	-4.528	2.275	-1.373	2.149	-1.090	-0.526	0.823	-2.201	0.003
0	2	-2.371	-2.669	2.145	-0.384	2.104	-1.198	-0.539	1.038	-1.829	0.027
		-3.162	-2.623	2.554	-0.755	2.228	-1.158	-0.523	0.651	-1.958	0.038
0	3	-0.800	-0.891	2.355	0.264	2.094	-1.246	-0.523	0.856	-1.564	0.010
		-1.960	-0.615	2.755	-0.143	2.288	-1.148	-0.500	0.476	-1.697	0.082
0	4	0.662	0.766	-	-	-	-	-	-	-	-
		-0.488	1.259	-	-	-	-	-	-	-	-
1	1	-3.152	-3.502	2.899	-0.938	2.793	-1.451	-0.775	1.591	-2.785	0.051
		-4.081	-3.140	3.295	-1.329	2.944	-1.429	-0.761	1.200	-2.919	0.027
1	2	-1.658	-1.802	3.346	-0.266	3.034	-1.653	-0.851	1.565	-2.804	0.042
		-2.946	-1.384	3.722	-0.712	3.273	-1.572	-0.826	1.150	-2.946	0.074
1	3	-0.063	0.011	3.675	0.498	3.116	-1.738	-0.864	1.386	-2.559	0.029
		-1.659	0.459	4.027	0.046	3.415	-1.600	-0.836	0.992	-2.720	0.108
1	4	1.481	1.749	-	-	-	-	-	-	-	-
		-0.360	2.339	-	-	-	-	-	-	-	-
2	2	-0.471	-0.414	4.179	0.186	3.567	-1.901	-1.041	1.772	-3.245	0.047
		-1.606	-0.010	4.430	-0.135	3.773	-1.822	-1.021	1.449	-3.379	0.088
2	3	0.951	1.209	4.711	0.864	3.821	-2.016	-1.120	1.712	-3.220	0.048
		-0.340	1.704	4.903	0.562	4.065	-1.897	-1.092	1.406	-3.360	0.120
2	4	2.403	2.833	-	-	-	-	-	-	-	-
		1.028	3.413	-	-	-	-	-	-	-	-
3	3	2.125	2.552	5.468	1.391	4.270	-2.152	-1.281	1.807	-3.487	0.058
		1.232	2.986	5.495	1.214	4.454	-2.065	-1.246	1.580	-3.608	0.155
3	4	3.403	3.975	-	-	-	-	-	-	-	-
		2.481	4.467	-	-	-	-	-	-	-	-
4	4	4.463	5.147	-	-	-	-	-	-	-	-
		3.807	5.532	-	-	-	-	-	-	-	-

TABEL 2 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 1 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.193	-5.467	1.814	-1.691	1.902	-0.799	-0.488	1.221	-2.049	0.064
		-5.437	-5.820	1.865	-1.783	1.916	-0.873	-0.474	0.849	-2.178	-0.013
0	1	-3.838	-4.049	1.968	-1.096	2.068	-1.073	-0.540	1.206	-2.058	0.053
		-4.302	-4.124	2.244	-1.351	2.122	-1.097	-0.525	0.830	-2.195	0.009
0	2	-2.213	-2.272	2.131	-0.368	2.081	-1.202	-0.538	1.040	-1.823	0.034
		-2.991	-2.232	2.522	-0.728	2.236	-1.164	-0.522	0.660	-1.950	0.043
0	3	-0.635	-0.519	2.341	0.283	2.071	-1.249	-	-	-	-
		-1.779	-0.249	2.728	-0.113	2.252	-1.154	-	-	-	-
1	1	-2.977	-3.058	2.880	-0.920	2.764	-1.456	-0.773	1.596	-2.778	0.060
		-3.894	-2.701	3.142	-1.193	2.861	-1.453	-0.759	1.202	-2.913	0.036
1	2	-1.469	-1.365	3.323	-0.242	3.003	-1.657	-0.850	1.572	-2.795	0.052
		-2.740	-0.955	3.593	-0.560	3.156	-1.607	-0.825	1.153	-2.938	0.084
1	3	0.135	0.426	3.651	0.526	3.085	-1.740	-	-	-	-
		-1.441	0.864	3.922	0.194	3.283	-1.649	-	-	-	-
2	2	-0.264	0.024	4.151	0.215	3.532	-1.903	-1.038	1.782	-3.233	0.059
		-1.407	0.430	4.326	-0.015	3.678	-1.846	-1.017	1.449	-3.371	0.101
2	3	1.169	1.632	4.683	0.898	3.788	-2.017	-	-	-	-
		-0.131	2.129	4.817	0.682	3.960	-1.931	-	-	-	-
3	3	2.356	2.969	5.441	1.428	4.239	-2.152	-	-	-	-
		1.437	3.416	5.442	1.283	4.398	-2.075	-	-	-	-

TABEL 3 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 2 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.093	-5.453	1.832	-1.683	1.912	-0.793	-0.489	1.201	-2.070	0.062
		-5.334	-5.807	1.881	-1.773	1.925	-0.867	-0.478	0.914	-2.172	-0.003
0	1	-3.707	-3.903	1.995	-1.085	2.083	-1.064	-0.542	1.170	-2.085	0.056
		-4.165	-3.981	2.268	-1.337	2.137	-1.088	-0.532	0.911	-2.181	0.018
0	2	-2.056	-2.030	2.166	-0.353	2.099	-1.192	-0.540	0.988	-1.849	0.038
		-2.825	-1.993	2.554	-0.710	2.213	-1.155	-0.531	0.735	-1.935	0.037
0	3	-0.456	-0.225	-	-	-	-	-	-	-	-
		-1.589	0.041	-	-	-	-	-	-	-	-
1	1	-2.813	-2.805	2.921	-0.902	2.786	-1.443	-0.776	1.527	-2.812	0.066
		-3.478	-2.530	3.185	-1.177	2.884	-1.440	-0.765	1.231	-2.916	0.048
1	2	-1.281	-1.045	3.376	-0.219	3.030	-1.641	-0.851	1.469	-2.828	0.060
		-2.209	-0.766	3.648	-0.538	3.185	-1.591	-0.832	1.153	-2.938	0.084
1	3	0.342	0.777	-	-	-	-	-	-	-	-
		-0.816	1.054	-	-	-	-	-	-	-	-
2	2	-0.058	0.383	4.218	0.244	3.567	-1.885	-1.040	1.628	-3.263	0.069
		-0.931	0.692	4.397	0.009	3.717	-1.827	-1.021	1.330	-3.391	0.109
2	3	1.387	2.000	-	-	-	-	-	-	-	-
		0.395	2.379	-	-	-	-	-	-	-	-
3	3	2.576	3.330	-	-	-	-	-	-	-	-
		1.780	3.731	-	-	-	-	-	-	-	-

TABEL 4 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 3 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.968	-5.082	1.828	-1.682	1.898	-0.795	-0.489	1.204	-2.068	0.086
		-5.205	-5.438	1.830	-1.732	1.907	-0.862	-0.478	0.916	-2.168	0.001
0	1	-3.559	-3.514	1.990	-1.078	2.066	-1.065	-0.541	1.174	-2.079	0.061
		-4.010	-3.597	2.181	-1.266	2.100	-1.091	-0.531	0.914	-2.176	0.022
0	2	-1.898	-1.657	2.163	-0.340	2.083	-1.192	-	-	-	-
		-2.658	-1.625	2.464	-0.623	2.163	-1.168	-	-	-	-
1	1	-2.638	-2.388	2.915	-0.888	2.766	-1.443	-0.774	1.535	-2.803	0.074
		-3.305	-2.114	3.123	-1.110	2.844	-1.440	-0.763	1.233	-2.908	0.058
1	2	-1.093	-0.636	3.373	-0.198	3.012	-1.640	-	-	-	-
		-2.024	-0.357	3.587	-0.456	3.135	-1.599	-	-	-	-
2	2	0.147	0.791	4.222	0.272	3.552	-1.882	-	-	-	-
		-0.743	1.105	4.375	0.061	3.689	-1.827	-	-	-	-

TABEL 5 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 4 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.907	-4.952	1.845	-1.674	1.907	-0.789	-0.490	1.154	-2.085	0.070
		-5.094	-5.304	1.848	-1.725	1.917	-0.856	-0.480	0.912	-2.172	0.015
0	1	-3.459	-3.264	2.016	-1.067	2.080	-1.056	-0.542	1.085	-2.097	0.066
		-3.813	-3.386	2.209	-1.255	2.115	-1.082	-0.534	0.866	-2.180	0.034
0	2	-1.758	-1.351	-	-	-	-	-	-	-	-
		-2.371	-1.367	-	-	-	-	-	-	-	-
1	1	-2.498	-2.056	2.955	-0.871	2.788	-1.431	-0.775	1.861	-2.819	0.081
		-3.072	-1.820	3.167	-1.096	2.868	-1.428	-0.764	1.571	-2.920	0.065
1	2	-0.918	-0.271	-	-	-	-	-	-	-	-
		-1.720	-0.032	-	-	-	-	-	-	-	-
2	2	0.346	1.171	-	-	-	-	-	-	-	-
		-0.488	1.468	-	-	-	-	-	-	-	-

TABEL 6 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 5 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.776	-4.595	1.843	-1.681	1.897	-0.790	-0.489	1.072	-2.081	0.073
		-4.963	-4.949	1.846	-1.727	1.906	-0.850	-0.479	0.827	-2.169	0.018
0	1	-3.307	-2.895	2.021	-1.065	2.073	-1.057	-	-	-	-
		-3.660	-3.019	2.191	-1.234	2.104	-1.080	-	-	-	-
1	1	-2.320	-1.570	2.972	-0.860	2.785	-1.396	-	-	-	-
		-2.900	-1.333	3.175	-1.078	2.864	-1.392	-	-	-	-

TABEL 7 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 6 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.765	-4.365	1.860	-1.672	1.907	-0.783	-0.489	0.851	-2.077	-0.008
		-4.945	-4.709	1.864	-1.718	1.916	-0.843	-0.479	0.601	-2.185	-0.064
0	1	-3.238	-2.608	-	-	-	-	-	-	-	-
		-3.577	-2.729	-	-	-	-	-	-	-	-
1	1	-2.199	-1.000	-	-	-	-	-	-	-	-
		-2.774	-0.757	-	-	-	-	-	-	-	-

TABEL 8 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 7 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.625	-4.077	1.877	-1.664	1.916	-0.841	-	-	-	-
		-4.804	-4.423	1.882	-1.711	1.925	-0.902	-	-	-	-

TABEL 9 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 8 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-4.489	-3.724	-	-	-	-	-	-	-	-
		-4.668	-4.072	-	-	-	-	-	-	-	-

TABEL 10 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.905	-8.009	1.733	-1.737	1.871	-0.828	-0.491	1.210	-2.071	0.032
		-6.186	-8.342	1.820	-1.856	1.888	-0.904	-0.476	0.808	-2.212	-0.050
0	1	-4.674	-6.711	1.844	-1.167	2.018	-1.116	-0.546	1.187	-2.094	0.011
		-5.212	-6.744	2.174	-1.462	2.085	-1.136	-0.529	0.770	-2.248	-0.035
0	2	-3.108	-4.803	1.972	-0.459	2.013	-1.254	-0.545	1.012	-1.868	-0.012
		-3.989	-4.715	2.419	-0.864	2.150	-1.207	-0.526	0.589	-2.013	0.001
0	3	-1.562	-2.840	2.151	0.175	1.987	-1.307	-0.530	0.826	-1.607	-0.029
		-2.836	-2.517	2.583	-0.267	2.200	-1.197	-0.503	0.410	-1.758	0.051
0	4	-0.110	-0.984	-	-	-	-	-	-	-	-
		-1.748	-0.432	-	-	-	-	-	-	-	-
1	1	-3.972	-5.899	2.691	-1.027	2.684	-1.519	-0.783	1.560	-2.836	0.000
		-4.988	-5.501	3.124	-1.453	2.846	-1.490	-0.770	1.186	-2.967	-0.025
1	2	-2.539	-4.109	3.081	-0.379	2.896	-1.733	-0.862	1.519	-2.868	-0.015
		-3.945	-3.635	3.491	-0.862	3.154	-1.641	-0.838	1.123	-3.005	0.015
1	3	-0.978	-2.132	3.362	0.363	2.953	-1.826	-0.876	1.326	-2.629	-0.030
		-2.717	-1.616	3.744	-0.124	3.275	-1.673	-0.849	0.950	-2.784	0.046
1	4	0.547	-0.209	-	-	-	-	-	-	-	-
		-1.447	0.459	-	-	-	-	-	-	-	-
2	2	-1.431	-2.684	3.840	0.040	3.391	-1.997	-1.055	1.702	-3.326	-0.020
		-2.518	-2.291	4.084	-0.268	3.584	-1.922	-1.038	1.434	-3.439	0.013
2	3	-0.052	-0.938	4.311	0.692	3.614	-2.122	-1.137	1.618	-3.310	-0.025
		-1.292	-0.459	4.504	0.402	3.842	-2.008	-1.114	1.365	-3.427	0.035
2	4	1.373	0.835	-	-	-	-	-	-	-	-
		0.050	1.397	-	-	-	-	-	-	-	-
3	3	1.063	0.473	4.998	1.187	4.027	-2.273	-1.302	1.677	-3.588	-0.020
		0.320	0.837	5.025	1.042	4.176	-2.200	-1.275	1.506	-3.681	0.054
3	4	2.306	2.003	-	-	-	-	-	-	-	-
		1.538	2.416	-	-	-	-	-	-	-	-
4	4	3.314	3.230	-	-	-	-	-	-	-	-
		2.826	3.522	-	-	-	-	-	-	-	-

TABEL 11 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY = -0.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.769	-7.450	1.724	-1.729	1.850	-0.838	-0.491	1.213	-2.066	0.039
		-6.040	-7.788	1.785	-1.833	1.863	-0.914	-0.476	0.818	-2.204	-0.042
0	1	-4.515	-6.135	1.829	-1.154	1.990	-1.125	-0.545	1.192	-2.085	0.020
		-5.034	-6.179	2.126	-1.429	2.048	-1.148	-0.529	0.786	-2.235	-0.026
0	2	-2.941	-4.266	1.953	-0.441	1.982	-1.262	-0.544	1.019	-1.857	-0.002
		-3.795	-4.190	2.368	-0.824	2.104	-1.220	-0.526	0.607	-1.998	0.010
0	3	-1.391	-2.358	2.133	0.198	1.957	-1.313	-	-	-	-
		-2.631	-2.048	2.543	-0.222	2.149	-1.210	-	-	-	-
1	1	-3.784	-5.293	2.666	-1.007	2.646	-1.529	-0.780	1.569	-2.821	0.014
		-4.775	-4.906	2.917	-1.270	2.737	-1.526	-0.767	1.191	-2.953	-0.011
1	2	-2.339	-3.535	3.051	-0.353	2.853	-1.742	-0.859	1.532	-2.850	-0.000
		-3.710	-3.077	3.314	-0.660	2.997	-1.693	-0.835	1.131	-2.988	0.030
1	3	-0.772	-1.608	3.332	0.396	2.911	-1.833	-	-	-	-
		-2.469	-1.112	3.599	0.075	3.098	-1.745	-	-	-	-
2	2	-1.213	-2.126	3.805	0.074	3.344	-2.005	-1.051	1.722	-3.303	-0.003
		-2.313	-1.730	3.958	-0.124	3.466	-1.956	-1.033	1.440	-3.421	0.032
2	3	0.174	-0.419	4.276	0.732	3.569	-2.129	-	-	-	-
		-1.079	0.064	4.396	0.545	3.714	-2.054	-	-	-	-
3	3	1.301	0.969	4.964	1.231	3.984	-2.278	-	-	-	-
		0.519	1.351	4.963	1.118	4.108	-2.217	-	-	-	-

TABEL 12 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 2 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.698	-7.542	1.746	-1.720	1.863	-0.828	-0.492	1.185	-2.096	0.037
		-5.961	-7.881	1.804	-1.820	1.876	-0.903	-0.481	0.906	-2.196	-0.027
0	1	-4.408	-6.042	1.862	-1.141	2.010	-1.111	-0.547	1.140	-2.124	0.024
		-4.910	-6.092	2.153	-1.410	2.067	-1.134	-0.537	0.891	-2.218	-0.014
0	2	-2.798	-4.027	1.996	-0.424	2.007	-1.247	-0.546	0.946	-1.895	0.004
		-3.629	-3.957	2.404	-0.800	2.127	-1.206	-0.538	0.704	-1.980	0.003
0	3	-1.212	-2.031	-	-	-	-	-	-	-	-
		-2.423	-1.728	-	-	-	-	-	-	-	-
1	1	-3.637	-5.051	2.718	-0.987	2.675	-1.510	-0.783	1.471	-2.872	0.022
		-4.289	-4.776	2.971	-1.253	2.768	-1.507	-0.774	1.210	-2.965	0.005
1	2	-2.160	-3.187	3.117	-0.327	2.891	-1.720	-0.862	1.386	-2.898	0.011
		-3.070	-2.906	3.382	-0.637	3.037	-1.671	-0.845	1.109	-2.996	0.032
1	3	-0.562	-1.203	-	-	-	-	-	-	-	-
		-1.696	-0.923	-	-	-	-	-	-	-	-
2	2	-1.007	-1.715	3.889	0.107	3.391	-1.979	-1.053	1.500	-3.348	0.012
		-1.783	-1.436	4.048	-0.099	3.519	-1.928	-1.037	1.253	-3.456	0.045
2	3	0.400	0.019	-	-	-	-	-	-	-	-
		-0.484	0.360	-	-	-	-	-	-	-	-
3	3	1.536	1.410	-	-	-	-	-	-	-	-
		0.883	1.746	-	-	-	-	-	-	-	-

TABEL 13 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 3 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.557	-7.000	1.739	-1.722	1.844	-0.832	-0.491	1.190	-2.088	0.044
		-5.814	-7.343	1.736	-1.770	1.853	-0.898	-0.480	0.909	-2.188	-0.020
0	1	-4.246	-5.496	1.854	-1.136	1.986	-1.114	-0.545	1.149	-2.112	0.032
		-4.736	-5.553	2.037	-1.319	2.018	-1.139	-0.535	0.898	-2.207	-0.006
0	2	-2.628	-3.526	1.991	-0.410	1.984	-1.248	-	-	-	-
		-3.442	-3.465	2.285	-0.687	2.060	-1.224	-	-	-	-
1	1	-3.448	-4.486	2.708	-0.974	2.647	-1.512	-0.781	1.487	-2.855	0.034
		-4.104	-4.211	2.895	-1.176	2.716	-1.510	-0.771	1.217	-2.951	0.017
1	2	-1.960	-2.658	3.111	-0.304	2.864	-1.721	-	-	-	-
		-2.875	-2.377	3.306	-0.539	2.973	-1.684	-	-	-	-
2	2	-0.793	-1.204	3.891	0.138	3.369	-1.978	-	-	-	-
		-1.594	-0.917	4.022	-0.042	3.485	-1.930	-	-	-	-

TABEL 14 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 4 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.556	-6.963	1.760	-1.712	1.858	-0.822	-0.493	1.118	-2.116	0.050
		-5.747	-7.302	1.758	-1.760	1.867	-0.888	-0.484	0.893	-2.198	-0.001
0	1	-4.196	-5.289	1.887	-1.123	2.006	-1.101	-0.546	1.019	-2.138	0.040
		-4.558	-5.399	2.072	-1.307	2.038	-1.127	-0.538	0.817	-2.215	0.010
0	2	-2.521	-3.224	-	-	-	-	-	-	-	-
		-3.141	-3.228	-	-	-	-	-	-	-	-
1	1	-3.349	-4.162	2.758	-0.954	2.677	-1.494	-0.782	1.246	-2.876	0.044
		-3.892	-3.934	2.951	-1.161	2.748	-1.492	-0.773	0.988	-2.968	0.030
1	2	-1.810	-2.271	-	-	-	-	-	-	-	-
		-2.567	-2.039	-	-	-	-	-	-	-	-
2	2	-0.606	-0.782	-	-	-	-	-	-	-	-
		-1.347	-0.513	-	-	-	-	-	-	-	-

TABEL 15 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 5 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.401	-6.440	1.756	-1.726	1.843	-0.819	-0.492	1.128	-2.108	0.055
		-5.591	-6.782	1.756	-1.768	1.851	-0.876	-0.483	0.899	-2.191	0.003
0	1	-4.023	-4.772	1.891	-1.124	1.995	-1.097	-	-	-	-
		-4.383	-4.885	2.049	-1.285	2.023	-1.119	-	-	-	-
1	1	-3.151	-3.633	2.777	-0.944	2.673	-1.487	-	-	-	-
		-3.702	-3.403	2.960	-1.143	2.743	-1.483	-	-	-	-

TABEL 16 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 6 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.480	-6.264	1.777	-1.715	1.857	-0.810	-0.491	0.881	-2.100	0.060
		-5.661	-6.597	1.778	-1.758	1.865	-0.868	-0.482	0.645	-2.184	0.008
0	1	-4.023	-4.513	-	-	-	-	-	-	-	-
		-4.366	-4.625	-	-	-	-	-	-	-	-
1	1	-3.082	-3.299	-	-	-	-	-	-	-	-
		-3.629	-3.062	-	-	-	-	-	-	-	-

TABEL 17 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 7 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.306	-5.769	1.797	-1.705	1.869	-0.803	-	-	-	-
		-5.487	-6.105	1.798	-1.749	1.877	-0.861	-	-	-	-

TABEL 18 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 8 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.142	-5.324	-	-	-	-	-	-	-	-
		-5.322	-5.662	-	-	-	-	-	-	-	-

TABEL 19 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 0 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.524	-11.729	1.629	-1.779	1.818	-0.912	-0.497	1.194	-2.120	-0.020
		-6.899	-12.026	1.778	-1.956	1.839	-0.994	-0.478	0.716	-2.289	-0.114
0	1	-5.403	-10.442	1.679	-1.234	1.930	-1.229	-0.556	1.155	-2.173	-0.056
		-6.123	-10.379	2.112	-1.618	2.020	-1.243	-0.535	0.637	-2.370	-0.108
0	2	-3.881	-8.161	1.758	-0.546	1.898	-1.383	-0.558	0.965	-1.966	-0.081
		-5.023	-7.959	2.316	-1.052	2.076	-1.315	-0.532	0.435	-2.152	-0.060
0	3	-2.347	-5.723	1.898	0.071	1.850	-1.442	-0.546	0.764	-1.712	-0.094
		-3.952	-5.276	2.424	-0.478	2.124	-1.299	-0.511	0.247	-1.910	0.008
0	4	-0.889	-3.392	-	-	-	-	-	-	-	-
		-2.927	-2.682	-	-	-	-	-	-	-	-
1	1	-4.823	-9.692	2.432	-1.127	2.552	-1.681	-0.799	1.502	-2.963	-0.089
		-6.075	-9.198	2.968	-1.650	2.749	-1.636	-0.787	1.158	-3.087	-0.115
1	2	-3.451	-7.584	2.746	-0.511	2.721	-1.918	-0.884	1.427	-3.026	-0.111
		-5.179	-6.964	3.246	-1.100	3.037	-1.800	-0.862	1.066	-3.153	-0.084
1	3	-1.916	-5.176	2.966	0.205	2.745	-2.022	-0.902	1.201	-2.800	-0.124
		-4.047	-4.485	3.428	-0.382	3.136	-1.828	-0.876	0.857	-2.945	-0.054
1	4	-0.396	-2.810	-	-	-	-	-	-	-	-
		-2.813	-1.938	-	-	-	-	-	-	-	-
2	2	-2.413	-5.937	3.402	-0.126	3.171	-2.219	-1.084	1.560	-3.523	-0.126
		-3.418	-5.564	3.632	-0.411	3.344	-2.150	-1.072	1.379	-3.601	-0.104
2	3	-1.074	-3.854	3.795	0.491	3.351	-2.360	-1.171	1.419	-3.524	-0.134
		-2.224	-3.405	3.985	0.223	3.555	-2.254	-1.155	1.249	-3.604	-0.094
2	4	0.331	-1.721	-	-	-	-	-	-	-	-
		-0.900	-1.194	-	-	-	-	-	-	-	-
3	3	-0.014	-2.217	4.377	0.949	3.723	-2.539	-1.342	1.398	-3.823	-0.134
		-0.519	-1.967	4.400	0.852	3.819	-2.490	-1.326	1.304	-3.877	-0.091
3	4	1.192	-0.423	-	-	-	-	-	-	-	-
		0.670	-0.139	-	-	-	-	-	-	-	-
4	4	2.146	0.966	-	-	-	-	-	-	-	-
		1.886	1.127	-	-	-	-	-	-	-	-

TABEL 20 : HAMADA JOHNSTON G-MATRIXELEMENTS

Z=NCM=LCM = 1 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.374	-12.626	1.602	-1.776	1.769	-0.913	-0.495	1.145	-2.104	-0.004
		-7.716	-12.934	1.687	-1.908	1.782	-0.994	-0.477	0.694	-2.263	-0.094
0	1	-6.048	-11.114	1.641	-1.224	1.868	-1.225	-0.553	1.089	-2.146	-0.036
		-6.703	-11.084	1.989	-1.547	1.935	-1.246	-0.533	0.607	-2.328	-0.086
0	2	-4.280	-8.560	1.714	-0.527	1.830	-1.375	-0.554	0.890	-1.933	-0.061
		-5.328	-8.398	2.188	-0.966	1.969	-1.322	-0.530	0.398	-2.105	-0.043
0	3	-2.508	-5.853	1.852	0.100	1.783	-1.431	-	-	-	-
		-3.994	-5.449	2.316	-0.381	2.003	-1.311	-	-	-	-
1	1	-5.561	-10.514	2.377	-1.110	2.463	-1.666	-0.794	1.365	-2.920	-0.063
		-6.730	-10.053	2.608	-1.357	2.545	-1.664	-0.782	1.012	-3.046	-0.088
1	2	-3.904	-8.082	2.682	-0.482	2.625	-1.898	-0.877	1.273	-2.973	-0.084
		-5.519	-7.512	2.932	-0.770	2.754	-1.852	-0.854	0.902	-3.103	-0.056
1	3	-2.093	-5.355	2.901	0.247	2.651	-2.000	-	-	-	-
		-4.086	-4.724	3.157	-0.056	2.821	-1.917	-	-	-	-
2	2	-2.880	-6.490	3.335	-0.089	3.061	-2.188	-1.075	1.308	-3.457	-0.097
		-3.908	-6.111	3.450	-0.236	3.149	-2.152	-1.062	1.104	-3.544	-0.072
2	3	-1.249	-4.067	3.727	0.540	3.245	-2.326	-	-	-	-
		-2.425	-3.609	3.821	0.401	3.348	-2.270	-	-	-	-
3	3	-0.179	-2.449	4.321	1.002	3.612	-2.494	-	-	-	-
		-0.749	-2.167	4.316	0.934	3.689	-2.454	-	-	-	-

TABEL 21 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 2 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.508	-11.476	1.633	-1.765	1.792	-0.890	-0.499	1.143	-2.162	-0.007
		-6.816	-11.791	1.710	-1.888	1.805	-0.969	-0.488	0.876	-2.259	-0.069
0	1	-5.295	-9.848	1.689	-1.207	1.902	-1.194	-0.557	1.064	-2.221	-0.030
		-5.887	-9.840	2.020	-1.514	1.966	-1.215	-0.548	0.832	-2.311	-0.067
0	2	-3.679	-7.344	1.776	-0.506	1.872	-1.340	-0.558	0.836	-2.005	-0.050
		-4.640	-7.208	2.231	-0.926	2.005	-1.291	-0.550	0.611	-2.086	-0.052
0	3	-2.052	-4.796	-	-	-	-	-	-	-	-
		-3.430	-4.421	-	-	-	-	-	-	-	-
1	1	-4.648	-8.853	2.452	-1.086	2.513	-1.624	-0.799	1.321	-3.018	-0.048
		-5.277	-8.577	2.689	-1.337	2.597	-1.622	-0.792	1.116	-3.093	-0.062
1	2	-3.179	-6.578	2.778	-0.451	2.688	-1.850	-0.882	1.163	-3.065	-0.065
		-4.056	-6.295	3.032	-0.744	2.821	-1.803	-0.869	0.946	-3.143	-0.049
1	3	-1.552	-4.099	-	-	-	-	-	-	-	-
		-2.644	-3.816	-	-	-	-	-	-	-	-
2	2	-2.081	-4.855	3.457	-0.050	3.138	-2.132	-1.079	1.151	-3.542	-0.074
		-2.701	-4.625	3.582	-0.211	3.235	-2.092	-1.068	0.977	-3.621	-0.050
2	3	-0.665	-2.738	-	-	-	-	-	-	-	-
		-1.373	-2.460	-	-	-	-	-	-	-	-
3	3	0.431	-1.120	-	-	-	-	-	-	-	-
		-0.018	-0.879	-	-	-	-	-	-	-	-

TABEL 22 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 3 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.276	-10.220	1.619	-1.775	1.758	-0.899	-0.497	1.158	-2.139	0.006
		-6.570	-10.541	1.609	-1.818	1.766	-0.963	-0.486	0.888	-2.237	-0.056
0	1	-5.053	-8.662	1.671	-1.210	1.860	-1.202	-0.554	1.092	-2.189	-0.015
		-5.618	-8.671	1.842	-1.385	1.888	-1.227	-0.545	0.855	-2.281	-0.052
0	2	-3.450	-6.341	1.761	-0.494	1.833	-1.347	-	-	-	-
		-4.371	-6.225	2.043	-0.762	1.902	-1.324	-	-	-	-
1	1	-4.377	-7.689	2.429	-1.079	2.463	-1.631	-0.794	1.376	-2.969	-0.029
		-5.013	-7.413	2.583	-1.248	2.518	-1.629	-0.786	1.156	-3.049	-0.044
1	2	-2.919	-5.574	2.761	-0.428	2.642	-1.858	-	-	-	-
		-3.806	-5.292	2.925	-0.625	2.729	-1.826	-	-	-	-
2	2	-1.812	-3.948	3.450	-0.016	3.098	-2.139	-	-	-	-
		-2.474	-3.705	3.548	-0.150	3.184	-2.102	-	-	-	-

TABEL 23 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 4 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.464	-10.771	1.650	-1.761	1.782	-0.879	-0.499	1.019	-2.192	0.017
		-6.660	-11.089	1.642	-1.805	1.790	-0.943	-0.491	0.822	-2.265	-0.029
0	1	-5.168	-8.889	1.718	-1.191	1.895	-1.176	-0.555	0.837	-2.235	-0.002
		-5.540	-8.981	1.892	-1.368	1.924	-1.201	-0.548	0.663	-2.303	-0.029
0	2	-3.456	-6.315	-	-	-	-	-	-	-	-
		-4.084	-6.298	-	-	-	-	-	-	-	-
1	1	-4.419	-7.691	2.501	-1.053	2.514	-1.596	-0.795	0.895	-3.005	-0.012
		-4.908	-7.477	2.664	-1.231	2.573	-1.594	-0.787	0.685	-3.081	-0.024
1	2	-2.865	-5.389	-	-	-	-	-	-	-	-
		-3.547	-5.170	-	-	-	-	-	-	-	-
2	2	-1.686	-3.638	-	-	-	-	-	-	-	-
		-2.287	-3.413	-	-	-	-	-	-	-	-

TABEL 24 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 5 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.211	-9.569	1.637	-1.795	1.756	-0.874	-0.497	1.054	-2.167	0.026
		-6.406	-9.893	1.632	-1.832	1.762	-0.927	-0.489	0.849	-2.243	-0.021
0	1	-4.906	-7.779	1.718	-1.206	1.875	-1.169	-	-	-	-
		-5.275	-7.875	1.858	-1.353	1.898	-1.189	-	-	-	-
1	1	-4.139	-6.630	2.522	-1.050	2.504	-1.587	-	-	-	-
		-4.643	-6.412	2.676	-1.220	2.563	-1.583	-	-	-	-

TABEL 25 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 6 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.583	-9.916	1.668	-1.776	1.780	-0.858	-0.495	0.537	-2.148	0.034
		-6.766	-10.233	1.664	-1.815	1.786	-0.912	-0.487	0.321	-2.226	-0.013
0	1	-5.137	-7.929	-	-	-	-	-	-	-	-
		-5.484	-8.026	-	-	-	-	-	-	-	-
1	1	-4.250	-6.601	-	-	-	-	-	-	-	-
		-4.752	-6.375	-	-	-	-	-	-	-	-

TABEL 26 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 7 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.261	-8.751	1.696	-1.759	1.801	-0.845	-	-	-	-
		-6.444	-9.072	1.693	-1.799	1.807	-0.900	-	-	-	-

TABEL 27 : HAMADA JOHNSTON G-MATRIXELEMENTS

2=NCM+LCM = 8 STARTING ENERGY = 52.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.999	-7.866	-	-	-	-	-	-	-	-
		-6.181	-8.191	-	-	-	-	-	-	-	-

TABEL 28 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY = 82.0

NL NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0 0	-6.952	-16.211	1.524	-1.813	1.733	-0.932	-0.505	1.169	-2.199	-0.078
	-7.689	-16.419	1.926	-2.222	1.774	-1.040	-0.474	0.543	-2.470	-0.219
0 1	-5.870	-14.727	1.525	-1.280	1.813	-1.255	-0.568	1.111	-2.297	-0.125
	-7.289	-14.325	2.379	-2.023	2.001	-1.247	-0.530	0.411	-2.647	-0.200
0 2	-4.344	-11.791	1.567	-0.600	1.758	-1.412	-0.575	0.899	-2.117	-0.146
	-6.500	-11.179	2.572	-1.512	2.107	-1.263	-0.523	0.209	-2.443	-0.097
0 3	-2.782	-8.597	1.676	0.011	1.694	-1.471	-0.564	0.678	-1.872	-0.152
	-5.685	-7.707	2.571	-0.969	2.221	-1.197	-0.501	0.012	-2.236	0.029
0 4	-1.282	-5.537	-	-	-	-	-	-	-	-
	-4.895	-4.253	-	-	-	-	-	-	-	-
1 1	-5.343	-13.842	2.209	-1.197	2.373	-1.707	-0.820	1.416	-3.161	-0.175
	-7.426	-13.013	3.114	-2.075	2.703	-1.612	-0.810	1.209	-3.274	-0.201
1 2	-3.979	-11.151	2.467	-0.593	2.509	-1.948	-0.910	1.295	-3.268	-0.196
	-6.846	-10.043	3.290	-1.571	3.044	-1.738	-0.890	1.093	-3.379	-0.173
1 3	-2.426	-8.050	2.642	0.114	2.509	-2.054	-0.933	1.020	-3.056	-0.203
	-5.954	-6.784	3.393	-0.840	3.157	-1.714	-0.910	0.830	-3.186	-0.140
1 4	-0.873	-5.004	-	-	-	-	-	-	-	-
	-4.798	-3.456	-	-	-	-	-	-	-	-
2 2	-2.959	-9.062	3.066	-0.231	2.902	-2.242	-1.119	1.349	-3.818	-0.216
	-3.847	-8.723	3.274	-0.485	3.051	-2.182	-1.114	1.212	-3.854	-0.206
2 3	-1.618	-6.428	3.401	0.375	3.052	-2.386	-1.211	1.119	-3.838	-0.221
	-2.639	-6.026	3.581	0.135	3.227	-2.292	-1.204	0.989	-3.875	-0.204
2 4	-0.198	-3.743	-	-	-	-	-	-	-	-
	-1.297	-3.270	-	-	-	-	-	-	-	-
3 3	-0.575	-4.404	3.939	0.810	3.374	-2.554	-1.388	0.964	-4.159	-0.222
	-0.807	-4.288	3.952	0.767	3.416	-2.532	-1.382	1.057	-4.177	-0.207
3 4	0.626	-2.204	-	-	-	-	-	-	-	-
	0.386	-2.072	-	-	-	-	-	-	-	-
4 4	1.550	-0.560	-	-	-	-	-	-	-	-
	1.481	-0.512	-	-	-	-	-	-	-	-

TABEL 29 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.332	-12.488	1.508	-1.807	1.692	-1.003	-0.501	1.196	-2.153	-0.047
		-6.884	-12.745	1.640	-2.005	1.706	-1.100	-0.477	0.603	-2.364	-0.160
0	1	-5.274	-11.215	1.497	-1.267	1.754	-1.341	-0.561	1.161	-2.224	-0.089
		-6.276	-11.012	1.962	-1.709	1.846	-1.360	-0.541	0.490	-2.484	-0.150
0	2	-3.854	-8.896	1.532	-0.578	1.691	-1.502	-0.566	0.973	-2.029	-0.112
		-5.404	-8.527	2.151	-1.156	1.877	-1.426	-0.529	0.283	-2.274	-0.079
0	3	-2.424	-6.407	1.641	0.045	1.629	-1.563	-	-	-	-
		-4.552	-5.778	2.252	-0.587	1.923	-1.401	-	-	-	-
1	1	-4.676	-10.353	2.156	-1.174	2.294	-1.821	-0.809	1.518	-3.046	-0.130
		-6.273	-9.719	2.363	-1.399	2.365	-1.821	-0.798	1.197	-3.163	-0.156
1	2	-3.425	-8.252	2.401	-0.558	2.420	-2.072	-0.896	1.447	-3.128	-0.152
		-5.626	-7.426	2.631	-0.822	2.532	-2.030	-0.875	1.112	-3.246	-0.127
1	3	-2.014	-5.838	2.575	0.162	2.421	-2.181	-	-	-	-
		-4.725	-4.903	2.814	-0.118	2.571	-2.105	-	-	-	-
2	2	-2.392	-6.465	2.978	-0.184	2.810	-2.386	-1.099	1.598	-3.647	-0.171
		-3.330	-6.111	3.048	-0.274	2.861	-2.364	-1.091	1.477	-3.699	-0.157
2	3	-1.188	-4.424	3.313	0.430	2.963	-2.537	-	-	-	-
		-2.265	-4.001	3.373	0.345	3.024	-2.503	-	-	-	-
3	3	-0.142	-2.682	3.841	0.869	3.296	-2.721	-	-	-	-
		-0.482	-2.512	3.832	0.840	3.332	-2.702	-	-	-	-

TABEL 30 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 2 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.062	-16.417	1.549	-1.794	1.725	-0.941	-0.506	1.094	-2.264	-0.053
		-7.450	-16.706	1.663	-1.958	1.739	-1.029	-0.496	0.842	-2.357	-0.112
0	1	-5.891	-14.431	1.562	-1.248	1.805	-1.261	-0.569	0.963	-2.369	-0.079
		-6.641	-14.326	1.973	-1.629	1.884	-1.280	-0.560	0.751	-2.454	-0.114
0	2	-4.239	-11.099	1.616	-0.555	1.756	-1.414	-0.573	0.679	-2.168	-0.097
		-5.437	-10.852	2.161	-1.062	1.918	-1.350	-0.566	0.474	-2.245	-0.100
0	3	-2.540	-7.665	-	-	-	-	-	-	-	-
		-4.225	-7.170	-	-	-	-	-	-	-	-
1	1	-5.280	-13.166	2.260	-1.146	2.369	-1.712	-0.818	1.114	-3.233	-0.108
		-5.877	-12.893	2.477	-1.380	2.444	-1.711	-0.813	0.970	-3.287	-0.119
1	2	-3.791	-10.181	2.535	-0.524	2.514	-1.949	-0.905	0.830	-3.305	-0.125
		-4.624	-9.901	2.773	-0.798	2.633	-1.905	-0.895	0.679	-3.360	-0.114
1	3	-2.106	-6.910	-	-	-	-	-	-	-	-
		-3.142	-6.628	-	-	-	-	-	-	-	-
2	2	-2.683	-7.935	3.152	-0.142	2.923	-2.243	-1.108	0.614	-3.812	-0.139
		-3.128	-7.765	3.240	-0.254	2.988	-2.216	-1.101	0.509	-3.862	-0.124
2	3	-1.236	-5.205	-	-	-	-	-	-	-	-
		-1.745	-5.001	-	-	-	-	-	-	-	-
3	3	-0.135	-3.170	-	-	-	-	-	-	-	-
		-0.391	-3.023	-	-	-	-	-	-	-	-

TABEL 31 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 3 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.311	-12.372	1.527	-1.820	1.677	-0.976	-0.502	1.156	-2.204	-0.029
		-6.662	-12.670	1.509	-1.858	1.684	-1.038	-0.492	0.898	-2.299	-0.089
0	1	-5.204	-10.766	1.531	-1.266	1.744	-1.300	-0.562	1.071	-2.284	-0.054
		-5.882	-10.705	1.687	-1.431	1.768	-1.324	-0.553	0.851	-2.371	-0.090
0	2	-3.690	-8.183	1.588	-0.549	1.697	-1.456	-	-	-	-
		-4.779	-7.986	1.855	-0.805	1.759	-1.433	-	-	-	-
1	1	-4.534	-9.628	2.217	-1.151	2.299	-1.762	-0.808	1.341	-3.109	-0.078
		-5.145	-9.354	2.336	-1.284	2.340	-1.761	-0.802	1.173	-3.172	-0.091
1	2	-3.188	-7.335	2.499	-0.505	2.448	-2.005	-	-	-	-
		-4.039	-7.053	2.628	-0.660	2.513	-1.980	-	-	-	-
2	2	-2.087	-5.453	3.125	-0.106	2.869	-2.309	-	-	-	-
		-2.600	-5.259	3.189	-0.196	2.927	-2.283	-	-	-	-

TABEL 32 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 4 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.478	-16.776	1.572	-1.797	1.719	-0.934	-0.506	0.819	-2.302	-0.011
		-7.679	-17.074	1.557	-1.837	1.726	-0.997	-0.499	0.652	-2.365	-0.050
0	1	-6.152	-14.248	1.600	-1.238	1.805	-1.247	-0.565	0.457	-2.368	-0.034
		-6.532	-14.320	1.762	-1.407	1.830	-1.271	-0.559	0.313	-2.426	-0.057
0	2	-4.285	-10.567	-	-	-	-	-	-	-	-
		-4.918	-10.529	-	-	-	-	-	-	-	-
1	1	-5.421	-12.646	2.322	-1.116	2.384	-1.691	-0.809	0.139	-3.174	-0.054
		-5.846	-12.452	2.454	-1.263	2.431	-1.690	-0.803	-0.024	-3.234	-0.063
1	2	-3.731	-9.392	-	-	-	-	-	-	-	-
		-4.323	-9.192	-	-	-	-	-	-	-	-
2	2	-2.494	-6.997	-	-	-	-	-	-	-	-
		-2.953	-6.818	-	-	-	-	-	-	-	-

TABEL 33 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 5 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.897	-13.100	1.544	-1.868	1.673	-0.927	-0.502	0.946	-2.239	0.003
		-7.096	-13.405	1.535	-1.900	1.678	-0.975	-0.495	0.767	-2.306	-0.038
0	1	-5.599	-10.993	1.589	-1.276	1.768	-1.240	-	-	-	-
		-5.976	-11.073	1.710	-1.407	1.787	-1.258	-	-	-	-
1	1	-4.866	-9.659	2.339	-1.127	2.361	-1.682	-	-	-	-
		-5.316	-9.457	2.464	-1.268	2.409	-1.678	-	-	-	-

TABEL 34 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 6 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.920	-15.869	1.591	-1.828	1.716	-0.899	-0.499	-0.271	-2.200	0.014
		-8.101	-16.171	1.583	-1.862	1.721	-0.949	-0.492	-0.467	-2.270	-0.027
0	1	-6.352	-13.143	-	-	-	-	-	-	-	-
		-6.699	-13.226	-	-	-	-	-	-	-	-
1	1	-5.392	-11.270	-	-	-	-	-	-	-	-
		-5.845	-11.057	-	-	-	-	-	-	-	-

TABEL 35 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 7 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.155	-12.214	1.628	-1.801	1.749	-0.878	-	-	-	-
		-7.337	-12.522	1.622	-1.837	1.754	-0.929	-	-	-	-

TABEL 36 : HAMADA JOHNSTON G-MATRIXELEMENTS

2*NCM+LCM = 8 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.681	-10.289	-	-	-	-	-	-	-	-
		-6.864	-10.602	-	-	-	-	-	-	-	-

TABEL 37 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 0 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.576	-3.977	1.368	-1.731	1.901	-0.881	-0.460	1.261	-2.277	-0.051
		-5.852	-4.282	1.607	-1.673	1.851	-0.880	-0.478	1.071	-2.142	-0.809
0	1	-4.365	-2.314	2.078	-1.176	2.169	-1.154	-0.509	1.163	-2.269	-0.066
		-4.924	-2.091	2.174	-1.256	2.115	-1.116	-0.534	0.975	-2.158	-0.368
0	2	-2.830	-0.243	2.679	-0.444	2.233	-1.265	-0.506	0.912	-1.980	-0.065
		-3.779	0.432	2.434	-0.619	2.177	-1.208	-0.535	0.727	-1.928	0.189
0	3	-1.325	1.838	3.115	0.250	2.220	-1.287	-0.488	0.674	-1.664	-0.054
		-2.655	2.734	2.631	0.010	2.216	-1.224	-0.510	0.469	-1.674	0.419
0	4	0.069	3.785	-	-	-	-	-	-	-	-
		-1.585	4.759	-	-	-	-	-	-	-	-
1	1	-3.557	0.039	3.229	-0.967	2.892	-1.539	-0.728	1.477	-3.033	-0.086
		-4.687	0.508	3.193	-1.151	2.888	-1.490	-0.757	1.288	-2.960	-0.110
1	2	-2.154	2.287	3.949	-0.236	3.136	-1.723	-0.795	1.370	-3.031	-0.082
		-3.630	2.897	3.631	-0.480	3.184	-1.658	-0.818	1.143	-2.985	-0.027
1	3	-0.663	4.515	4.463	0.612	3.190	-1.787	-0.799	1.131	-2.744	-0.065
		-2.420	5.249	3.863	0.328	3.305	-1.710	-0.802	0.876	-2.765	-0.032
1	4	0.766	6.588	-	-	-	-	-	-	-	-
		-1.233	7.432	-	-	-	-	-	-	-	-
2	2	-0.997	5.220	4.845	0.351	3.616	-1.961	-0.964	1.518	-3.500	-0.077
		-2.252	5.632	4.554	0.164	3.700	-1.911	-0.967	1.309	-3.505	-0.174
2	3	0.300	7.397	5.419	1.157	3.803	-2.066	-1.025	1.418	-3.472	-0.056
		-1.129	7.859	4.992	0.942	3.958	-2.012	-1.013	1.174	-3.504	-0.076
2	4	1.610	9.427	-	-	-	-	-	-	-	-
		0.087	9.975	-	-	-	-	-	-	-	-
3	3	1.421	10.354	6.092	1.888	4.146	-2.207	-1.155	1.493	-3.784	-0.081
		0.423	10.652	5.846	1.725	4.318	-2.180	-1.140	1.261	-3.814	-0.018
3	4	2.545	12.277	-	-	-	-	-	-	-	-
		1.543	12.628	-	-	-	-	-	-	-	-
4	4	3.546	15.124	-	-	-	-	-	-	-	-
		2.882	15.393	-	-	-	-	-	-	-	-

TABEL 38 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.492	-3.370	1.349	-1.718	1.881	-0.890	-0.460	1.260	-2.274	-0.048
		-5.764	-3.677	1.607	-1.659	1.839	-0.890	-0.477	1.072	-2.140	-0.801
0	1	-4.265	-1.636	2.049	-1.155	2.142	-1.165	-0.508	1.162	-2.264	-0.061
		-4.814	-1.419	2.152	-1.231	2.088	-1.128	-0.532	0.977	-2.154	-0.362
0	2	-2.723	0.449	2.643	-0.416	2.202	-1.275	-0.505	0.911	-1.974	-0.059
		-3.657	1.117	2.414	-0.585	2.143	-1.220	-0.534	0.729	-1.922	0.194
0	3	-1.213	2.523	3.076	0.284	2.189	-1.297	-	-	-	-
		-2.526	3.410	2.617	0.051	2.179	-1.236	-	-	-	-
1	1	-3.438	0.828	3.186	-0.935	2.855	-1.551	-0.727	1.477	-3.025	-0.078
		-4.554	1.290	3.218	-1.056	2.845	-1.518	-0.757	1.286	-2.952	-0.102
1	2	-2.024	3.097	3.897	-0.195	3.094	-1.735	-0.794	1.370	-3.020	-0.073
		-3.481	3.700	3.702	-0.365	3.108	-1.690	-0.817	1.141	-2.974	-0.019
1	3	-0.527	5.322	4.405	0.661	3.147	-1.798	-	-	-	-
		-2.262	6.047	3.986	0.462	3.198	-1.742	-	-	-	-
2	2	-0.854	6.090	4.780	0.401	3.569	-1.974	-0.963	1.518	-3.486	-0.064
		-2.118	6.503	4.576	0.266	3.629	-1.938	-0.966	1.303	-3.491	-0.163
2	3	0.450	8.268	5.348	1.215	3.755	-2.079	-	-	-	-
		-0.989	8.731	5.050	1.060	3.866	-2.040	-	-	-	-
3	3	1.581	11.265	6.015	1.955	4.099	-2.219	-	-	-	-
		0.554	11.571	5.819	1.813	4.257	-2.197	-	-	-	-

TABEL 39 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 2 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.444	-3.134	1.368	-1.704	1.889	-0.885	-0.461	1.233	-2.299	-0.049
		-5.716	-3.444	1.624	-1.646	1.848	-0.885	-0.474	1.080	-2.191	-0.708
0	1	-4.193	-1.249	2.077	-1.134	2.153	-1.159	-0.510	1.113	-2.296	-0.059
		-4.739	-1.037	2.179	-1.209	2.100	-1.122	-0.526	0.978	-2.208	-0.351
0	2	-2.627	0.930	2.678	-0.390	2.216	-1.268	-0.507	0.842	-2.005	-0.056
		-3.558	1.591	2.451	-0.558	2.158	-1.213	-0.529	0.719	-1.966	0.181
0	3	-1.093	3.043	-	-	-	-	-	-	-	-
		-2.401	3.922	-	-	-	-	-	-	-	-
1	1	-3.339	1.319	3.227	-0.905	2.871	-1.543	-0.729	1.384	-3.066	-0.074
		-4.145	1.642	3.257	-1.027	2.862	-1.510	-0.751	1.229	-3.010	-0.092
1	2	-1.904	3.635	3.947	-0.156	3.114	-1.726	-0.796	1.235	-3.060	-0.066
		-2.960	4.100	3.750	-0.328	3.129	-1.680	-0.813	1.046	-3.025	-0.026
1	3	-0.387	5.858	-	-	-	-	-	-	-	-
		-1.666	6.429	-	-	-	-	-	-	-	-
2	2	-0.717	6.613	4.842	0.453	3.593	-1.964	-0.965	1.315	-3.523	-0.053
		-1.688	6.923	4.632	0.314	3.656	-1.927	-0.966	1.097	-3.532	-0.160
2	3	0.600	8.745	-	-	-	-	-	-	-	-
		-0.504	9.093	-	-	-	-	-	-	-	-
3	3	1.736	11.652	-	-	-	-	-	-	-	-
		0.841	11.907	-	-	-	-	-	-	-	-

TABEL 40 : REID SOFT-CORE G-MATRIXELEMENTS

Z=NCM+LCM = 3 STARTING ENERGY =-60.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.358	-2.558	1.362	-1.698	1.871	-0.891	-0.461	1.234	-2.295	-0.048
		-5.627	-2.870	1.647	-1.643	1.860	-0.898	-0.474	1.081	-2.186	-0.708
0	1	-4.093	-0.614	2.067	-1.119	2.130	-1.164	-0.509	1.116	-2.290	-0.055
		-4.632	-0.406	2.160	-1.165	2.080	-1.135	-0.525	0.981	-2.201	-0.347
0	2	-2.519	1.572	2.666	-0.365	2.193	-1.274	-	-	-	-
		-3.439	2.227	2.489	-0.492	2.132	-1.230	-	-	-	-
1	1	-3.220	2.048	3.210	-0.877	2.843	-1.549	-0.728	1.389	-3.056	-0.066
		-4.030	2.372	3.233	-0.976	2.836	-1.522	-0.751	1.232	-2.999	-0.084
1	2	-1.776	4.381	3.926	-0.116	3.085	-1.733	-	-	-	-
		-2.837	4.847	3.770	-0.255	3.098	-1.696	-	-	-	-
2	2	-0.577	7.411	4.818	0.503	3.565	-1.970	-	-	-	-
		-1.567	7.727	4.625	0.377	3.628	-1.936	-	-	-	-

TABEL 41 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 4 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 Q2	3 Q1	3 Q2	3 Q3
0	0	-5.360	-2.167	1.399	-1.685	1.879	-0.887	-0.462	1.178	-2.319	-0.042
		-5.573	-2.484	1.682	-1.630	1.868	-0.894	-0.473	1.044	-2.226	-0.598
0	1	-4.062	-0.084	2.136	-1.100	2.142	-1.158	-0.510	1.018	-2.312	-0.050
		-4.466	0.076	2.229	-1.147	2.092	-1.129	-0.523	0.893	-2.236	-0.296
0	2	-2.450	2.151	-	-	-	-	-	-	-	-
		-3.194	2.726	-	-	-	-	-	-	-	-
1	1	-3.155	2.672	3.249	-0.847	2.859	-1.541	-0.729	1.209	-3.076	-0.061
		-3.857	2.949	3.271	-0.948	2.853	-1.514	-0.751	1.040	-3.023	-0.059
1	2	-1.678	5.013	-	-	-	-	-	-	-	-
		-2.597	5.411	-	-	-	-	-	-	-	-
2	2	-0.454	8.019	-	-	-	-	-	-	-	-
		-1.383	8.300	-	-	-	-	-	-	-	-

TABEL 42 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 5 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 Q2	3 Q1	3 Q2	3 Q3
0	0	-5.269	-1.621	1.387	-1.686	1.868	-0.887	-0.461	1.183	-2.314	-0.039
		-5.482	-1.940	1.633	-1.637	1.857	-0.893	-0.472	1.048	-2.220	-0.600
0	1	-3.957	0.512	2.103	-1.090	2.131	-1.159	-	-	-	-
		-4.361	0.670	2.185	-1.132	2.088	-1.133	-	-	-	-
1	1	-3.033	3.351	3.262	-0.822	2.850	-1.541	-	-	-	-
		-3.743	3.630	3.277	-0.923	2.848	-1.515	-	-	-	-

TABEL 43 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 6 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.327	-0.985	1.403	-1.672	1.876	-0.893	-0.461	0.602	-2.309	-0.037
		-5.533	-1.294	1.649	-1.623	1.865	-0.899	-0.471	0.453	-2.214	-0.604
0	1	-3.965	1.198	-	-	-	-	-	-	-	-
		-4.356	1.349	-	-	-	-	-	-	-	-
1	1	-2.995	1.650	-	-	-	-	-	-	-	-
		-3.701	1.925	-	-	-	-	-	-	-	-

TABEL 44 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 7 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.227	-0.803	1.419	-1.659	1.883	-0.951	-	-	-	-
		-5.434	-1.113	1.664	-1.609	1.872	-0.957	-	-	-	-

TABEL 45 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 8 STARTING ENERGY =-68.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.131	-0.491	-	-	-	-	-	-	-	-
		-5.338	-0.803	-	-	-	-	-	-	-	-

TABEL 48 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.990	-7.146	1.266	-1.796	1.863	-0.906	-0.462	1.273	-2.299	-0.074
		-6.299	-7.434	1.506	-1.737	1.800	-0.902	-0.481	1.070	-2.154	-0.867
0	1	-4.849	-5.775	1.929	-1.275	2.112	-1.188	-0.512	1.181	-2.304	-0.097
		-5.487	-5.513	2.030	-1.366	2.053	-1.146	-0.540	0.976	-2.185	-0.403
0	2	-3.347	-3.697	2.496	-0.570	2.163	-1.302	-0.511	0.933	-2.024	-0.099
		-4.400	-2.967	2.230	-0.760	2.103	-1.241	-0.543	0.728	-1.967	0.161
0	3	-1.859	-1.509	2.907	0.100	2.140	-1.325	-0.494	0.695	-1.712	-0.087
		-3.315	-0.548	2.375	-0.157	2.136	-1.257	-0.517	0.467	-1.724	0.391
0	4	-0.474	0.576	-	-	-	-	-	-	-	-
		-2.273	1.625	-	-	-	-	-	-	-	-
1	1	-4.140	-4.005	3.012	-1.120	2.808	-1.584	-0.734	1.503	-3.091	-0.130
		-5.372	-3.481	2.965	-1.318	2.800	-1.530	-0.763	1.322	-3.020	-0.155
1	2	-2.777	-1.768	3.682	-0.431	3.032	-1.774	-0.803	1.397	-3.103	-0.131
		-4.389	-1.100	3.334	-0.691	3.080	-1.704	-0.826	1.181	-3.058	-0.070
1	3	-1.307	0.572	4.158	0.382	3.071	-1.839	-0.807	1.156	-2.825	-0.116
		-3.221	1.371	3.506	0.079	3.192	-1.756	-0.811	0.914	-2.845	-0.081
1	4	0.110	2.799	-	-	-	-	-	-	-	-
		-2.059	3.720	-	-	-	-	-	-	-	-
2	2	-1.683	0.853	4.516	0.101	3.487	-2.019	-0.974	1.541	-3.592	-0.135
		-2.886	1.257	4.242	-0.074	3.559	-1.972	-0.977	1.367	-3.595	-0.217
2	3	-0.411	3.140	5.044	0.861	3.656	-2.127	-1.036	1.433	-3.576	-0.117
		-1.784	3.596	4.633	0.660	3.793	-2.076	-1.026	1.231	-3.603	-0.136
2	4	0.885	5.330	-	-	-	-	-	-	-	-
		-0.581	5.870	-	-	-	-	-	-	-	-
3	3	0.663	5.896	5.663	1.536	3.978	-2.271	-1.169	1.491	-3.900	-0.097
		-0.169	6.151	5.458	1.406	4.113	-2.249	-1.158	1.312	-3.923	-0.048
3	4	1.769	7.987	-	-	-	-	-	-	-	-
		0.931	8.287	-	-	-	-	-	-	-	-
4	4	2.731	10.689	-	-	-	-	-	-	-	-
		2.237	10.896	-	-	-	-	-	-	-	-

TABEL 47 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.892	-6.360	1.243	-1.783	1.837	-0.919	-0.462	1.268	-2.292	-0.068
		-6.191	-6.653	1.511	-1.723	1.788	-0.917	-0.481	1.069	-2.150	-0.051
0	1	-4.735	-4.930	1.894	-1.254	2.076	-1.202	-0.511	1.173	-2.294	-0.089
		-5.349	-4.679	2.004	-1.336	2.017	-1.163	-0.538	0.973	-2.177	-0.393
0	2	-3.227	-2.869	2.454	-0.540	2.122	-1.316	-0.509	0.923	-2.011	-0.090
		-4.249	-2.156	2.214	-0.718	2.058	-1.257	-0.540	0.724	-1.955	0.170
0	3	-1.737	-0.720	2.860	0.138	2.099	-1.339	-	-	-	-
		-3.156	0.222	2.371	-0.106	2.085	-1.274	-	-	-	-
1	1	-4.003	-3.010	2.960	-1.085	2.759	-1.601	-0.732	1.490	-3.074	-0.118
		-5.205	-2.502	2.999	-1.198	2.745	-1.570	-0.761	1.307	-3.003	-0.143
1	2	-2.632	-0.790	3.618	-0.385	2.977	-1.791	-0.801	1.383	-3.082	-0.119
		-4.204	-0.139	3.434	-0.546	2.983	-1.747	-0.824	1.164	-3.037	-0.060
1	3	-1.159	1.504	4.088	0.438	3.016	-1.856	-	-	-	-
		-3.027	2.284	3.683	0.249	3.056	-1.802	-	-	-	-
2	2	-1.523	1.913	4.438	0.158	3.426	-2.037	-0.971	1.527	-3.566	-0.120
		-2.739	2.319	4.266	0.045	3.472	-2.006	-0.974	1.344	-3.570	-0.206
2	3	-0.247	4.149	4.958	0.928	3.594	-2.145	-	-	-	-
		-1.635	4.606	4.701	0.798	3.682	-2.112	-	-	-	-
3	3	0.837	6.958	5.570	1.609	3.917	-2.290	-	-	-	-
		-0.038	7.224	5.416	1.499	4.040	-2.273	-	-	-	-

TABEL 48 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 2 STARTING ENERGY = -8.0

NL	NR	1 SO	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.873	-6.142	1.270	-1.768	1.848	-0.911	-0.463	1.226	-2.329	-0.070
		-6.166	-6.439	1.536	-1.709	1.801	-0.910	-0.476	1.076	-2.223	-0.720
0	1	-4.687	-4.481	1.933	-1.232	2.093	-1.192	-0.513	1.099	-2.342	-0.086
		-5.285	-4.240	2.041	-1.312	2.035	-1.153	-0.528	0.967	-2.255	-0.377
0	2	-3.145	-2.259	2.502	-0.512	2.143	-1.305	-0.511	0.820	-2.057	-0.085
		-4.145	-1.559	2.265	-0.688	2.080	-1.247	-0.532	0.701	-2.019	0.150
0	3	-1.619	-0.023	-	-	-	-	-	-	-	-
		-3.011	0.902	-	-	-	-	-	-	-	-
1	1	-3.920	-2.355	3.017	-1.051	2.784	-1.587	-0.735	1.350	-3.135	-0.111
		-4.706	-2.033	3.054	-1.166	2.771	-1.555	-0.755	1.211	-3.085	-0.128
1	2	-2.519	-0.039	3.688	-0.341	3.007	-1.776	-0.803	1.181	-3.140	-0.109
		-3.550	0.425	3.501	-0.504	3.015	-1.732	-0.819	1.011	-3.108	-0.069
1	3	-1.017	2.283	-	-	-	-	-	-	-	-
		-2.268	2.853	-	-	-	-	-	-	-	-
2	2	-1.384	2.724	4.524	0.214	3.463	-2.020	-0.974	1.225	-3.619	-0.107
		-2.246	3.005	4.344	0.095	3.513	-1.988	-0.975	1.037	-3.628	-0.203
2	3	-0.089	4.922	-	-	-	-	-	-	-	-
		-1.072	5.238	-	-	-	-	-	-	-	-
3	3	1.007	7.677	-	-	-	-	-	-	-	-
		0.270	7.889	-	-	-	-	-	-	-	-

TABEL 49 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 3 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.771	-5.398	1.265	-1.765	1.825	-0.919	-0.463	1.228	-2.320	-0.064
		-6.058	-5.698	1.562	-1.711	1.818	-0.926	-0.476	1.077	-2.213	-0.717
0	1	-4.570	-3.695	1.923	-1.218	2.064	-1.200	-0.512	1.103	-2.329	-0.079
		-5.153	-3.462	2.018	-1.260	2.012	-1.172	-0.527	0.971	-2.242	-0.370
0	2	-3.024	-1.498	2.489	-0.487	2.113	-1.313	-	-	-	-
		-4.005	-0.809	2.318	-0.610	2.048	-1.270	-	-	-	-
1	1	-3.784	-1.469	2.997	-1.025	2.746	-1.596	-0.734	1.359	-3.116	-0.101
		-4.575	-1.147	3.023	-1.113	2.737	-1.572	-0.755	1.216	-3.064	-0.118
1	2	-2.376	0.830	3.665	-0.301	2.970	-1.785	-	-	-	-
		-3.414	1.294	3.527	-0.425	2.977	-1.752	-	-	-	-
2	2	-1.229	3.640	4.495	0.268	3.426	-2.030	-	-	-	-
		-2.119	3.928	4.331	0.162	3.478	-2.001	-	-	-	-

TABEL S0 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 4 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.838	-5.012	1.289	-1.749	1.837	-0.911	-0.464	1.146	-2.356	-0.060
		-6.052	-5.319	1.583	-1.695	1.829	-0.918	-0.474	1.019	-2.269	-0.582
0	1	-4.594	-3.103	1.959	-1.196	2.081	-1.190	-0.513	0.959	-2.360	-0.073
		-4.999	-2.933	2.053	-1.239	2.029	-1.162	-0.525	0.840	-2.289	-0.306
0	2	-2.990	-0.809	-	-	-	-	-	-	-	-
		-3.737	-0.226	-	-	-	-	-	-	-	-
1	1	-3.760	-0.709	3.051	-0.991	2.771	-1.583	-0.734	1.095	-3.286	-0.092
		-4.419	-0.444	3.076	-1.082	2.763	-1.558	-0.754	0.937	-3.239	-0.086
1	2	-2.304	1.629	-	-	-	-	-	-	-	-
		-3.168	2.011	-	-	-	-	-	-	-	-
2	2	-1.119	4.462	-	-	-	-	-	-	-	-
		-1.943	4.713	-	-	-	-	-	-	-	-

TABEL S1 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 5 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.717	-4.309	1.298	-1.758	1.833	-0.911	-0.463	1.155	-2.345	-0.055
		-5.930	-4.619	1.545	-1.711	1.825	-0.917	-0.473	1.026	-2.256	-0.586
0	1	-4.463	-2.372	1.972	-1.190	2.077	-1.190	-	-	-	-
		-4.868	-2.205	2.052	-1.228	2.034	-1.165	-	-	-	-
1	1	-3.616	0.098	3.069	-0.969	2.760	-1.583	-	-	-	-
		-4.286	0.366	3.086	-1.059	2.757	-1.560	-	-	-	-

TABEL 52 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 6 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.867	-3.765	1.320	-1.741	1.834	-0.904	-0.463	0.913	-2.336	-0.051
		-6.072	-4.065	1.567	-1.693	1.826	0.910	-0.473	0.766	-2.246	-0.590
0	1	-4.542	-1.735	-	-	-	-	-	-	-	-
		-4.931	-1.576	-	-	-	-	-	-	-	-
1	1	-3.632	0.849	-	-	-	-	-	-	-	-
		-4.300	1.114	-	-	-	-	-	-	-	-

TABEL 53 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 7 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.731	-3.111	1.341	-1.724	1.845	-0.899	-	-	-	-
		-5.936	-3.413	1.588	-1.676	1.837	-0.905	-	-	-	-

TABEL 54 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 8 STARTING ENERGY = -8.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-5.622	-2.501	-	-	-	-	-	-	-	-
		-5.828	-2.805	-	-	-	-	-	-	-	-

TABEL 55 : _ REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY = 62.0

NL NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0 0	-6.667	-12.850	1.075	-1.879	1.780	-0.970	-0.469	1.356	-2.375	-0.131
	-7.078	-13.098	1.296	-1.818	1.679	-0.957	-0.492	1.118	-2.203	-1.030
0 1	-5.602	-11.676	1.652	-1.404	1.991	-1.273	-0.523	1.387	-2.427	-0.170
	-6.477	-11.299	1.764	-1.530	1.921	-1.220	-0.559	1.135	-2.286	-0.489
0 2	-4.102	-9.234	2.159	-0.736	2.014	-1.396	-0.524	1.243	-2.176	-0.172
	-5.469	-8.340	1.829	-0.976	1.950	-1.320	-0.563	0.984	-2.104	0.118
0 3	-2.586	-6.533	2.524	-0.097	1.973	-1.421	-0.509	1.087	-1.876	-0.157
	-4.420	-5.373	1.851	-0.413	1.976	-1.336	-0.534	0.799	-1.888	0.335
0 4	-1.160	-3.929	-	-	-	-	-	-	-	-
	-3.394	-2.653	-	-	-	-	-	-	-	-
1 1	-5.091	-12.330	2.611	-1.315	2.630	-1.698	-0.751	1.823	-3.294	-0.226
	-6.611	-11.648	2.533	-1.557	2.615	-1.630	-0.778	1.659	-3.227	-0.254
1 2	-3.719	-9.353	3.192	-0.683	2.814	-1.901	-0.824	1.878	-3.356	-0.233
	-5.711	-8.516	2.760	-0.995	2.870	-1.815	-0.846	1.684	-3.311	-0.161
1 3	-2.206	-6.036	3.602	0.081	2.825	-1.970	-0.832	1.758	-3.098	-0.216
	-4.560	-5.042	2.808	-0.281	2.972	-1.870	-0.837	1.541	-3.115	-0.177
1 4	-0.729	-2.815	-	-	-	-	-	-	-	-
	-3.373	-1.664	-	-	-	-	-	-	-	-
2 2	-2.756	-8.574	3.917	-0.223	3.220	-2.162	-1.002	2.110	-3.903	-0.248
	-3.869	-8.175	3.673	-0.380	3.276	-2.119	-1.005	1.994	-3.904	-0.304
2 3	-1.424	-4.794	4.364	0.474	3.354	-2.277	-1.068	2.136	-3.915	-0.233
	-2.700	-4.341	3.982	0.294	3.466	-2.230	-1.062	2.001	-3.933	-0.247
2 4	-0.054	-1.088	-	-	-	-	-	-	-	-
	-1.423	-0.552	-	-	-	-	-	-	-	-
3 3	-0.442	-3.311	4.891	1.073	3.637	-2.430	-1.206	2.191	-4.273	-0.220
	-1.011	-3.124	4.753	0.989	3.720	-2.415	-1.199	2.087	-4.287	-0.191
3 4	0.754	0.860	-	-	-	-	-	-	-	-
	0.179	1.000	-	-	-	-	-	-	-	-
4 4	1.647	2.882	-	-	-	-	-	-	-	-
	1.385	3.005	-	-	-	-	-	-	-	-

TABEL 56 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.324	-10.439	1.042	-1.886	1.734	-1.002	-0.467	1.153	-2.350	-0.115
		-6.698	-10.700	1.325	-1.822	1.668	-0.996	-0.489	0.927	-2.188	-0.976
0	1	-5.271	-9.362	1.601	-1.397	1.927	-1.308	-0.519	1.023	-2.386	-0.150
		-6.060	-9.027	1.729	-1.496	1.860	-1.263	-0.552	0.787	-2.253	-0.464
0	2	-3.820	-7.263	2.095	-0.710	1.943	-1.431	-0.520	0.752	-2.126	-0.153
		-5.073	-6.429	1.827	-0.914	1.871	-1.364	-0.556	0.511	-2.059	0.127
0	3	-2.364	-4.958	2.454	-0.051	1.901	-1.455	-	-	-	-
		-4.061	-3.871	1.892	-0.326	1.883	-1.380	-	-	-	-
1	1	-4.606	-7.342	2.533	-1.305	2.544	-1.740	-0.746	1.236	-3.224	-0.200
		-6.024	-6.716	2.582	-1.407	2.526	-1.711	-0.773	1.067	-3.156	-0.227
1	2	-3.317	-5.298	3.096	-0.646	2.718	-1.944	-0.818	1.088	-3.270	-0.207
		-5.175	-4.523	2.930	-0.794	2.715	-1.903	-0.841	0.888	-3.225	-0.138
1	3	-1.899	-3.046	3.497	0.147	2.729	-2.014	-	-	-	-
		-4.098	-2.123	3.119	-0.027	2.755	-1.963	-	-	-	-
2	2	-2.244	-2.244	3.799	-0.177	3.115	-2.209	-0.994	1.121	-3.802	-0.220
		-3.382	-1.845	3.676	-0.259	3.144	-2.186	-0.997	0.989	-3.804	-0.283
2	3	-1.044	-0.289	4.235	0.552	3.250	-2.325	-	-	-	-
		-2.347	0.164	4.045	0.458	3.308	-2.300	-	-	-	-
3	3	0.006	2.787	4.751	1.158	3.535	-2.480	-	-	-	-
		-0.634	2.992	4.658	1.090	3.613	-2.470	-	-	-	-

TABEL 57 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 2 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.876	-15.609	1.091	-1.857	1.762	-0.976	-0.470	1.379	-2.434	-0.119
		-7.214	-15.884	1.370	-1.795	1.701	-0.971	-0.482	1.293	-2.331	-0.754
0	1	-5.703	-13.427	1.673	-1.362	1.967	-1.276	-0.524	1.308	-2.496	-0.144
		-6.415	-13.125	1.795	-1.455	1.902	-1.233	-0.538	1.182	-2.412	-0.433
0	2	-4.082	-9.844	2.183	-0.673	1.991	-1.396	-0.524	1.057	-2.231	-0.143
		-5.233	-9.058	1.925	-0.869	1.921	-1.332	-0.545	0.944	-2.195	0.088
0	3	-2.445	-6.123	-	-	-	-	-	-	-	-
		-4.021	-5.093	-	-	-	-	-	-	-	-
1	1	-5.161	-14.260	2.638	-1.249	2.601	-1.698	-0.752	1.581	-3.364	-0.185
		-5.912	-13.940	2.685	-1.354	2.584	-1.668	-0.768	1.469	-3.323	-0.200
1	2	-3.659	-10.009	3.224	-0.587	2.786	-1.898	-0.824	1.419	-3.401	-0.189
		-4.647	-9.546	3.053	-0.738	2.785	-1.857	-0.837	1.282	-3.374	-0.151
1	3	-2.020	-5.562	-	-	-	-	-	-	-	-
		-3.222	-4.993	-	-	-	-	-	-	-	-
2	2	-2.649	-9.279	3.955	-0.100	3.196	-2.157	-0.999	1.305	-3.921	-0.198
		-3.337	-9.046	3.819	-0.190	3.229	-2.132	-0.999	1.164	-3.929	-0.276
2	3	-1.204	-4.331	-	-	-	-	-	-	-	-
		-1.991	-4.067	-	-	-	-	-	-	-	-
3	3	-0.197	-2.906	-	-	-	-	-	-	-	-
		-0.705	-2.757	-	-	-	-	-	-	-	-

TABEL 58 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM*LCM = 3 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.456	-10.870	1.084	-1.869	1.719	-0.994	-0.468	1.233	-2.400	-0.105
		-6.780	-11.151	1.395	-1.816	1.717	-1.002	-0.480	1.086	-2.296	-0.744
0	1	-5.315	-9.188	1.657	-1.363	1.914	-1.295	-0.521	1.099	-2.445	-0.129
		-5.991	-8.905	1.752	-1.400	1.860	-1.268	-0.535	0.971	-2.360	-0.418
0	2	-3.762	-6.526	2.163	-0.653	1.938	-1.415	-	-	-	-
		-4.866	-5.767	2.000	-0.769	1.870	-1.373	-	-	-	-
1	1	-4.655	-7.797	2.605	-1.233	2.531	-1.719	-0.747	1.320	-3.290	-0.166
		-5.416	-7.477	2.633	-1.304	2.521	-1.699	-0.764	1.200	-3.247	-0.182
1	2	-3.246	-5.009	3.184	-0.549	2.718	-1.921	-	-	-	-
		-4.246	-4.546	3.072	-0.651	2.719	-1.893	-	-	-	-
2	2	-2.166	-2.633	3.906	-0.041	3.130	-2.182	-	-	-	-
		-2.901	-2.387	3.784	-0.118	3.167	-2.160	-	-	-	-

TABEL 59 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 4 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 Q2	3 Q1	3 Q2	3 Q3
0	0	-6.772	-11.062	1.128	-1.845	1.747	-0.972	-0.470	1.018	-2.478	-0.095
		-6.987	-11.354	1.436	-1.792	1.743	-0.980	-0.479	0.903	-2.400	-0.541
0	1	-5.560	-8.922	1.722	-1.330	1.953	-1.267	-0.523	0.724	-2.514	-0.117
		-5.966	-8.736	1.817	-1.369	1.899	-1.239	-0.534	0.615	-2.451	-0.327
0	2	-3.883	-5.941	-	-	-	-	-	-	-	-
		-4.632	-5.343	-	-	-	-	-	-	-	-
1	1	-4.809	-6.892	2.701	-1.188	2.589	-1.683	-0.748	0.624	-3.343	-0.151
		-5.397	-6.646	2.729	-1.264	2.579	-1.662	-0.765	0.485	-3.305	-0.139
1	2	-3.297	-3.967	-	-	-	-	-	-	-	-
		-4.069	-3.612	-	-	-	-	-	-	-	-
2	2	-2.116	-1.167	-	-	-	-	-	-	-	-
		-2.782	-0.982	-	-	-	-	-	-	-	-

TABEL 60 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 5 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 Q2	3 Q1	3 Q2	3 Q3
0	0	-6.508	-9.258	1.143	-1.883	1.718	-0.971	-0.468	1.065	-2.438	-0.086
		-6.723	-9.554	1.385	-1.839	1.714	-0.977	-0.477	0.946	-2.358	-0.568
0	1	-5.298	-7.271	1.743	-1.344	1.928	-1.267	-	-	-	-
		-5.704	-7.090	1.818	-1.377	1.886	-1.244	-	-	-	-
1	1	-4.535	-5.169	2.730	-1.176	2.570	-1.683	-	-	-	-
		-5.142	-4.918	2.748	-1.252	2.566	-1.663	-	-	-	-

TABEL 61 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 6 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.087	-9.229	1.180	-1.851	1.746	-0.954	-0.467	0.443	-2.410	-0.078
		-7.290	-9.517	1.424	-1.806	1.742	-0.960	-0.477	0.299	-2.327	-0.573
0	1	-5.725	-7.004	-	-	-	-	-	-	-	-
		-6.110	-6.833	-	-	-	-	-	-	-	-
1	1	-4.823	-4.563	-	-	-	-	-	-	-	-
		-5.431	-4.314	-	-	-	-	-	-	-	-

TABEL 62 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 7 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.724	-7.649	1.212	-1.825	1.769	-0.941	-	-	-	-
		-6.928	-7.868	1.458	-1.780	1.765	-0.947	-	-	-	-

TABEL 63 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 8 STARTING ENERGY = 62.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.456	-6.470	-	-	-	-	-	-	-	-
		-6.660	-6.764	-	-	-	-	-	-	-	-

TABEL 64 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 0 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.717	-15.340	0.971	-1.893	1.732	-1.011	-0.474	1.176	-2.447	-0.168
		-7.547	-15.456	1.076	-1.819	1.474	-0.959	-0.512	-0.094	-2.171	-1.485
0	1	-5.688	-14.118	1.501	-1.432	1.921	-1.325	-0.530	1.025	-2.542	-0.213
		-7.527	-13.245	1.648	-1.710	1.820	-1.227	-0.597	-1.035	-2.318	-0.593
0	2	-4.225	-11.410	1.975	-0.782	1.930	-1.453	-0.534	0.735	-2.316	-0.213
		-6.866	-9.763	1.381	-1.232	1.864	-1.317	-0.601	-2.108	-2.187	0.202
0	3	-2.740	-8.410	2.317	-0.159	1.880	-1.479	-0.520	0.465	-2.024	-0.192
		-6.111	-6.337	1.080	-0.722	1.928	-1.322	-0.554	-3.185	-2.058	0.364
0	4	-1.335	-5.535	-	-	-	-	-	-	-	-
		-5.340	-3.214	-	-	-	-	-	-	-	-
1	1	-5.080	-12.254	2.424	-1.347	2.533	-1.767	-0.763	1.227	-3.473	-0.280
		-7.655	-10.919	2.238	-1.760	2.506	-1.650	-0.787	0.268	-3.413	-0.313
1	2	-3.785	-9.661	2.965	-0.747	2.696	-1.977	-0.840	1.036	-3.575	-0.287
		-7.172	-8.068	2.231	-1.262	2.800	-1.833	-0.861	-0.320	-3.531	-0.201
1	3	-2.342	-6.754	3.346	-0.015	2.694	-2.049	-0.850	0.720	-3.332	-0.265
		-6.312	-4.873	2.033	-0.608	2.953	-1.885	-0.856	-1.033	-3.346	-0.220
1	4	-0.928	-3.939	-	-	-	-	-	-	-	-
		-5.329	-1.756	-	-	-	-	-	-	-	-
2	2	-2.736	-6.448	3.672	-0.297	3.075	-2.248	-1.022	1.017	-4.178	-0.304
		-3.735	-6.010	3.466	-0.433	3.115	-2.210	-1.024	1.560	-4.178	-0.330
2	3	-1.522	-3.942	4.087	0.350	3.193	-2.366	-1.091	0.776	-4.208	-0.286
		-2.674	-3.435	3.748	0.195	3.279	-2.324	-1.089	0.052	-4.216	-0.293
2	4	-0.259	-1.486	-	-	-	-	-	-	-	-
		-1.505	-0.872	-	-	-	-	-	-	-	-
3	3	-0.490	-0.727	4.597	0.923	3.457	-2.522	-1.231	0.611	-4.588	-0.273
		-0.757	-0.613	4.535	0.887	3.491	-2.515	-1.228	-1.159	-4.593	-0.261
3	4	0.551	1.328	-	-	-	-	-	-	-	-
		0.279	1.461	-	-	-	-	-	-	-	-
4	4	1.452	4.235	-	-	-	-	-	-	-	-
		1.383	4.286	-	-	-	-	-	-	-	-

TABEL 65 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 1 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.269	-12.539	0.941	-1.906	1.670	-1.063	-0.470	1.030	-2.393	-0.141
		-6.846	-12.733	1.247	-1.831	1.561	-1.046	-0.499	0.741	-2.178	-1.208
0	1	-5.258	-11.457	1.455	-1.435	1.836	-1.386	-0.524	0.738	-2.456	-0.182
		-6.516	-10.893	1.625	-1.578	1.753	-1.327	-0.573	0.420	-2.281	-0.524
0	2	-3.869	-9.170	1.916	-0.761	1.835	-1.514	-0.526	0.330	-2.212	-0.184
		-5.742	-7.996	1.579	-1.034	1.749	-1.428	-0.576	-0.002	-2.117	0.155
0	3	-2.473	-6.638	2.253	-0.108	1.785	-1.539	-	-	-	-
		-4.918	-5.139	1.512	-0.464	1.763	-1.440	-	-	-	-
1	1	-4.448	-7.203	2.320	-1.356	2.413	-1.841	-0.754	0.773	-3.335	-0.241
		-6.401	-6.270	2.379	-1.446	2.392	-1.815	-0.779	0.624	-3.272	-0.272
1	2	-3.271	-5.547	2.836	-0.719	2.564	-2.055	-0.828	0.398	-3.408	-0.249
		-5.836	-4.429	2.692	-0.852	2.553	-2.018	-0.850	0.225	-3.364	-0.169
1	3	-1.970	-3.704	3.204	0.058	2.562	-2.127	-	-	-	-
		-4.986	-2.382	2.860	-0.099	2.575	-2.081	-	-	-	-
2	2	-2.078	-0.315	3.480	-0.265	2.931	-2.331	-1.007	0.233	-3.972	-0.265
		-3.124	0.093	3.409	-0.314	2.946	-2.317	-1.009	0.158	-3.972	-0.303
2	3	-1.055	0.453	3.876	0.436	3.050	-2.452	-	-	-	-
		-2.257	0.921	3.761	0.380	3.081	-2.437	-	-	-	-
3	3	0.065	5.088	4.347	1.018	3.319	-2.612	-	-	-	-
		-0.321	5.229	4.307	0.987	3.358	-2.608	-	-	-	-

TABEL 66 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 2 STARTING ENERGY = 82.0

NL	NR	1 SO	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.903	-15.267	1.009	-1.863	1.714	-1.017	-0.475	1.126	-2.530	-0.148
		-7.325	-15.516	1.304	-1.794	1.627	-1.005	-0.486	0.987	-2.432	-0.761
0	1	-5.797	-13.358	1.554	-1.387	1.899	-1.327	-0.531	0.931	-2.634	-0.175
		-6.723	-12.947	1.702	-1.507	1.824	-1.275	-0.544	0.812	-2.554	-0.460
0	2	-4.216	-10.079	2.037	-0.716	1.910	-1.451	-0.533	0.583	-2.382	-0.172
		-5.652	-9.124	1.735	-0.953	1.831	-1.375	-0.552	0.477	-2.349	0.053
0	3	-2.599	-6.672	-	-	-	-	-	-	-	-
		-4.523	-5.436	-	-	-	-	-	-	-	-
1	1	-5.143	-11.480	2.464	-1.278	2.502	-1.765	-0.763	1.014	-3.564	-0.222
		-5.852	-11.162	2.520	-1.373	2.482	-1.737	-0.774	0.933	-3.535	-0.235
1	2	-3.726	-8.313	3.011	-0.647	2.669	-1.971	-0.838	0.679	-3.622	-0.226
		-4.659	-7.849	2.858	-0.786	2.661	-1.932	-0.848	0.580	-3.602	-0.193
1	3	-2.152	-4.963	-	-	-	-	-	-	-	-
		-3.292	-4.391	-	-	-	-	-	-	-	-
2	2	-2.618	-5.337	3.693	-0.171	3.057	-2.238	-1.016	0.413	-4.169	-0.238
		-3.111	-5.159	3.602	-0.232	3.077	-2.221	-1.016	0.321	-4.176	-0.296
2	3	-1.287	-2.349	-	-	-	-	-	-	-	-
		-1.853	-2.146	-	-	-	-	-	-	-	-
3	3	-0.219	0.542	-	-	-	-	-	-	-	-
		-0.511	0.631	-	-	-	-	-	-	-	-

TABEL 67 : REID SOFT-CORE G-MATRIXELEMENTS

2=NCM+LCM = 3 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.155	-8.901	1.000	-1.921	1.653	-1.048	-0.471	0.991	-2.461	-0.127
		-6.538	-9.160	1.320	-1.869	1.656	-1.057	-0.483	0.849	-2.361	-0.749
0	1	-5.126	-7.711	1.532	-1.426	1.823	-1.361	-0.526	0.740	-2.534	-0.153
		-5.952	-7.351	1.626	-1.458	1.768	-1.335	-0.539	0.618	-2.453	-0.440
0	2	-3.689	-5.723	2.011	-0.714	1.834	-1.486	-	-	-	-
		-4.992	-4.848	1.857	-0.822	1.763	-1.446	-	-	-	-
1	1	-4.258	-3.376	2.419	-1.318	2.408	-1.805	-0.755	0.808	-3.415	-0.196
		-4.984	-3.058	2.447	-1.373	2.398	-1.789	-0.768	0.714	-3.381	-0.210
1	2	-3.036	-2.097	2.957	-0.636	2.577	-2.015	-	-	-	-
		-3.991	-1.633	2.873	-0.715	2.574	-1.993	-	-	-	-
2	2	-1.801	2.660	3.628	-0.146	2.966	-2.286	-	-	-	-
		-2.370	2.860	3.545	-0.197	2.992	-2.271	-	-	-	-

TABEL 68 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 4 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.505	-17.560	1.060	-1.884	1.700	-1.009	-0.475	0.830	-2.582	-0.112
		-7.722	-17.838	1.377	-1.832	1.701	-1.017	-0.483	0.729	-2.516	-0.512
0	1	-6.248	-14.557	1.621	-1.381	1.888	-1.312	-0.529	0.381	-2.639	-0.136
		-6.654	-14.353	1.716	-1.415	1.833	-1.285	-0.538	0.283	-2.585	-0.319
0	2	-4.441	-10.248	-	-	-	-	-	-	-	-
		-5.191	-9.633	-	-	-	-	-	-	-	-
1	1	-5.525	-13.033	2.549	-1.258	2.496	-1.742	-0.756	-0.109	-3.498	-0.176
		-6.032	-12.811	2.577	-1.319	2.486	-1.725	-0.769	-0.227	-3.469	-0.158
1	2	-3.885	-8.704	-	-	-	-	-	-	-	-
		-4.552	-8.382	-	-	-	-	-	-	-	-
2	2	-2.676	-6.074	-	-	-	-	-	-	-	-
		-3.183	-5.917	-	-	-	-	-	-	-	-

TABEL 69 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 5 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.949	-12.367	1.075	-1.954	1.658	-1.009	-0.472	0.982	-2.504	-0.100
		-7.165	-12.650	1.305	-1.914	1.657	-1.015	-0.480	0.875	-2.433	-0.526
0	1	-5.730	-10.083	1.642	-1.417	1.849	-1.314	-	-	-	-
		-6.136	-9.886	1.712	-1.444	1.809	-1.294	-	-	-	-
1	1	-4.986	-8.110	2.580	-1.261	2.466	-1.745	-	-	-	-
		-5.525	-7.879	2.597	-1.324	2.462	-1.729	-	-	-	-

TABEL 70 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 6 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-8.063	-13.803	1.122	-1.903	1.700	-0.982	-0.469	-0.197	-2.456	-0.090
		-8.264	-14.080	1.357	-1.862	1.699	-0.988	-0.479	-0.338	-2.381	-0.538
0	1	-6.592	-10.997	-	-	-	-	-	-	-	-
		-6.970	-10.813	-	-	-	-	-	-	-	-
1	1	-5.617	-8.278	-	-	-	-	-	-	-	-
		-6.161	-8.047	-	-	-	-	-	-	-	-

TABEL 71 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 7 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-7.330	-10.316	1.162	-1.866	1.732	-0.962	-	-	-	-
		-7.532	-10.597	1.401	-1.823	1.731	-0.968	-	-	-	-

TABEL 72 : REID SOFT-CORE G-MATRIXELEMENTS

2*NCM+LCM = 8 STARTING ENERGY = 82.0

NL	NR	1 S0	3 S1	1 P1	3 P0	3 P1	3 P2	1 D2	3 D1	3 D2	3 D3
0	0	-6.891	-8.381	-	-	-	-	-	-	-	-
		-7.093	-8.666	-	-	-	-	-	-	-	-