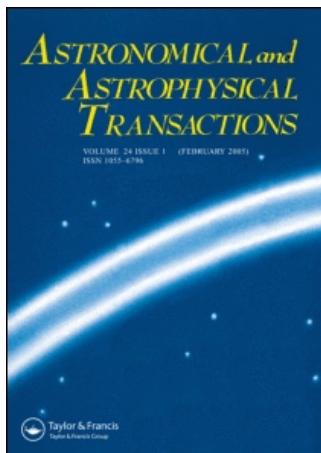


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## EXCITATION OF NITROGEN IONS BY ELECTRON IMPACT

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We present tables of the excitation cross-sections from the ground and some lower excited states and corresponding collision strengths for electron impact excitation of nitrogen ions of all degrees of ionization for an energy range from threshold up to 50 times the threshold energy for direct transitions, and for exchange transitions up to 12 times the threshold energy. Coefficients of the standard analytic approximation of the collision strengths, valid for direct transitions up to 100 times the threshold energy, are also given.

The calculations are made using Coulomb-Born-Exchange approximation.

KEY WORDS Electron-ion excitation, Coulomb-Born approximation

### 1 INTRODUCTION

We have calculated electron impact excitation cross-sections for a number of single-electron transitions of nitrogen ions. This problem has become important as in recent years spectroscopic studies of these objects have been started in different laboratories. Our prime goal was to produce estimates for a considerable number of excitation cross-sections that were expected to be important for the interpretation of experiments carried out in the gas electronics laboratory at the Ruhr-Universität, Bochum, Germany.

For our purposes the main interest was focused on the energy region of several hundred electron volts, while the threshold region was not of primary importance. This permitted us to make use of comparatively simple theoretical approaches to obtain the cross-sections. We have calculated the appropriate cross-sections using the Coulomb-Born-Exchange approximation (CBX) with allowance for the so-called normalization on the eigenchannel.

For our numerical calculations we have used the code package ATOM devised by L. A. Vainshtein, Lebedev Institute of Physics, Moscow, Russia. These codes were

tested there for many years and proved to be rather reliable within the limits of validity they were designed for. Their detailed description can be found in Vainstein and Shevelko (1986). Here we give just a short outline.

## 2 PROGRAM "ATOM"

In this package a comparatively simple approximation for atomic wave functions is used to make it fast and practical to produce data for considerable number of transitions. The wavefunction of the atom is presented in the form

$$\Psi = \sum_M C(M)D(M), \quad (1)$$

where  $D(M)$  is a determinant, composed of single-electron functions,  $M$  a set of magnetic quantum numbers, and  $C(M)$  is constructed according to the standard rules of angular momentum theory.

In most cases the active electron is located in the outer shell. The state of this shell can be represented as the linear combination

$$|\gamma_0 n l^m LS\rangle = \sum_{L_p S_p} G_{L_p S_p}^{L S} |\gamma_0 n l^{m-1} (L_p S_p) n l LS\rangle, \quad (2)$$

where  $G$  are fractional parentage coefficients. The single electron functions, of which the determinant  $D(M)$  is constructed, are defined in the central field approximation. This field can be chosen from a variety of forms, but usually the Hartree-type electron density, composed of Slater orbitals, is used. Designating such a field of the atomic core by  $U(r)$  we obtain the equation determining the wave function of the active atomic electron

$$\left[ \frac{d^2}{dr^2} - \frac{l(l+1)}{r^2} - 2\omega^{-1}U\left(\frac{r}{\omega}\right) + \epsilon \right] P(r) = 0. \quad (3)$$

Here  $\epsilon$  is the eigenvalue ( $\epsilon = 0$  corresponding to the ionization limit),  $\omega$  is a scaling factor, and  $U(r)$  has the following asymptotic form:

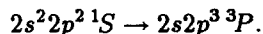
$$U = \omega^{-1}U\left(\frac{r}{\omega}\right) \rightarrow \frac{z}{r}, \quad (4)$$

$z$  being the residual charge number of the ion under consideration. This equation forms the basis of the so-called semi-empirical approach.

In this work, the code was used in the following way: if the experimental energy  $\epsilon_{\text{exp}}$  of the atomic state (its ionization potential) is known, as is usually the case, then  $\epsilon$  is put equal to this value:  $\epsilon = \epsilon_{\text{exp}}$  (a form of Coopman's theorem from the Hartree-Fock theory). In this case the appropriate subroutine adjusts  $\omega$  to ensure correct behavior of the wavefunction. This scheme was used in most of our calculations and it allows us to obtain the values of the matrix elements which otherwise would require more elaborate theory.

But in some cases (transitions between levels having the same orbital quantum numbers) it is not possible to adjust  $\omega$ 's for both initial and final levels without loss of orthogonality of the wavefunctions. In such cases only one  $\epsilon$  parameter (that for the lower state) is adjusted to the experimental value of the binding energy. The  $\epsilon$  value for the upper state is set equal to that of the lower one. Such a choice ensures the orthogonality of both states, because they prove to be two eigenfunctions of the same operator.

One more case should be mentioned. In a number of transitions an electron from an inner shell jumps to the higher level, for instance in the transition



In such cases we need to know the binding energies of the inner  $2s$  electrons. In the present work we have used the results of special Hartree-Fock term-dependent calculations to determine these parameters for the appropriate configurations.

### 3 ANALYTIC APPROXIMATION OF THE NUMERICAL DATA

The numerical results have been approximated by a simple analytic formula that allows us to present the results in a very compact form and to obtain the cross-sections for any desired energy (within the limits for which the original calculations were performed) without much effort. A number of analytic approximations are known in the literature. We have adopted the formula most frequently used in publications of similar results in *Atomic Data and Nuclear Data Tables* to represent the collision strengths *STR*:

$$STR = A + \frac{B}{X} + \frac{C}{X^2} + \frac{D}{X^3} + E \ln(X) \quad X = E_i/E_{01}. \quad (5)$$

Here  $E_{01}$  is the excitation energy and  $E_i$  the energy of the incident electron.

But we distinguish two cases - direct and exchange transitions. For direct transitions the procedure is standard. The cross-section  $SIG(E_i)$ , obtained by the numerical procedure, is multiplied by the energy  $X$  (in threshold units) and by the statistical weight of the initial level to get the collision strength, which is approximated by equation (5).

In the case of exchange transitions the cross-sections go down too steeply with the increase of energy to be represented by equation (5) well enough. So the collision strength described above is first multiplied by a factor

$$F(E_i) = (E_i + I)^2 \quad (6)$$

where  $E_i$  is collision energy and  $I$  - ionization potential of the upper level. This compensates for the steep fall down of such cross-sections (Burkova and Ochkur, 1980), and only then the fitting procedure using equation (5) is performed. Such a scheme gives better results than immediate approximation of the numerical data, and, which also may be desirable, gives correct high energy behavior without being too closely bound to the energy interval for which original calculations have been performed.

## 4 PRELIMINARY CALCULATIONS

Before starting our main calculations for nitrogen ions it was necessary to obtain some experience concerning the accuracy of the results provided by our approximation and the code. For this purpose we performed a number of calculations for different atoms and ions, but mostly for isoelectronic neighbors of the ions that were our immediate objects. Some of the results obtained are described below.

First, we tried to calculate the oscillator strengths for two transitions

$$2s^2\ ^1S \rightarrow 2s2p\ ^1P \text{ and } 2s^2\ ^1S \rightarrow 2s3p\ ^1P$$

for the He-like ions C III, N IV, O V and Ne VII for a comparison with the results obtained by Nakazaki and Hashimo (1982a) with configuration interaction wave functions. The results proved to differ between 10 and 25 percent. Even better agreement was obtained with the cross-sections calculated by these authors in Nakazaki and Hashimo (1982b).

Recently, Bhatia and Kastner (1993) have published extensive calculations of collision strengths for transitions in O III. Some of the transitions in N II that are important for our work have close analogs with the corresponding transitions in the isoelectronic O III. Thus, it was natural to make a number of calculations for O III to again test the accuracy of our procedures.

In Table 1 we compare the results for two direct and two exchange transitions for the collision energies used by the above authors:  $E_i/Ry = 4, 6, 8, 10, 12$ .

Table 1. Comparison of our collision strengths ( $STR$ ) for O III with those of Bhatia ( $STR_B$ )

$E_{if}$	$Ry$				
	4	6	8	10	12
$2s^2 2p^2\ ^1D \rightarrow 2s^2 2p3s\ ^1P$					
$STR$	0.141E+00	0.264E+00	0.361E+00	0.448E+00	0.521E+00
$STR_B$	0.120E+00	0.228E+00	0.330E+00	0.418E+00	0.493E+00
$STR/STR_B$	1.18	1.16	1.09	1.07	1.06
$2s^2 2p^2\ ^1S \rightarrow 2s^2 2p3p\ ^1S$					
$STR$	0.264E+00	0.264E+00	0.267E+00	0.271E+00	0.273E+00
$STR_B$	0.307E+00	0.377E+00	0.400E+00	0.410E+00	0.416E+00
$STR/STR_B$	0.860	0.700	0.667	0.661	0.656
$2s^2 2p^2\ ^1S \rightarrow 2s2p^3\ ^3P$					
$STR$	0.425E+00	0.232E+00	0.143E+00	0.934E-01	0.663E-01
$STR_B$	0.263E+00	0.145E+00	0.957E-01	0.692E-01	0.562E-01
$STR/STR_B$	1.62	1.60	1.49	1.35	1.18
$2s^2 2p^2\ ^1D \rightarrow 2s2p^3\ ^3D$					
$STR$	0.985E+00	0.650E+00	0.448E+00	0.318E+00	0.239E+00
$STR_B$	0.105E+01	0.621E+00	0.425E+00	0.312E+00	0.239E+00
$STR/STR_B$	0.938	1.05	1.05	1.02	1.00

From this Table one again can see that the discrepancy almost never exceeds the factor of 2 and often is much smaller. Taking into account that in Bhatia and Kastner (1993) accurate configuration interaction wave functions were used, we consider this correspondence to be quite satisfactory.

## 5 COMPARISON WITH *R*-MATRIX CALCULATIONS

We had also the chance to compare our results for six transitions in N III enumerated in Table 2 with detailed calculations made by Ptascheck (1994) by the *R*-matrix method for collision energies between the threshold and 3.5 Ry. In Table 2 the limits within which the results of both calculations vary in this energy interval.

**Table 2.** Comparison of collision strengths for N III obtained in this work with the CBX approximation with the results of *R*-matrix calculations by Ptascheck (1994)

<i>No.</i>	<i>Transition</i>	<i>R-matrix</i>	<i>This work</i>
1	$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 \ ^4P$	1.3–0.9	1.5–0.8
2	$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 \ ^2D$	7.0–6.0	7.0–10.0
3	$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 \ ^2S$	3.0–3.0	1.5–2.0
4	$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 \ ^2P$	10.0–11.0	10.0–16.0
5	$2s^2 2p^2 P^0 \rightarrow 2s^2 3s \ ^2S$	0.3–0.2	0.2–0.3
6	$2s^2 2p^2 P^0 \rightarrow 2s^2 6f \ ^2F^0$	0.1–0.5	0.03–0.04

First, we can see the striking overall agreement between the two sets of data. Then it is interesting to remark that for most stronger transitions (cases 2 and 4) our data show very good correspondence with the *R*-matrix results for lower energies. But at higher energies those results stay below ours, which is consistent with the neglect of higher partial waves (as  $L^T \leq 7$  in Ptascheck, 1994); such contributions, omitted because of the size of the problem, have yet to be considered. A detailed comparison for case 2 is made in Figure 1.

For the weakest transition (case 6), on the contrary, our data are about twice as low (see Table 2). It seems natural to explain this by the fact that with the CBX approximation there can be no transitions through the intermediate states, while in the *R*-matrix approach they definitely can make a contribution.

For cases of medium strength (1,5) there is surprisingly good agreement (Figure 2), and for case 3, which seems also to be of medium strength, our data are approximately twice as low.

It is possible that such a degree of agreement between the simple CBX approximation and the *R*-matrix in the low-energy region is just good luck. But after all, yet again we have agreement between the two methods to at least within a factor of 2.

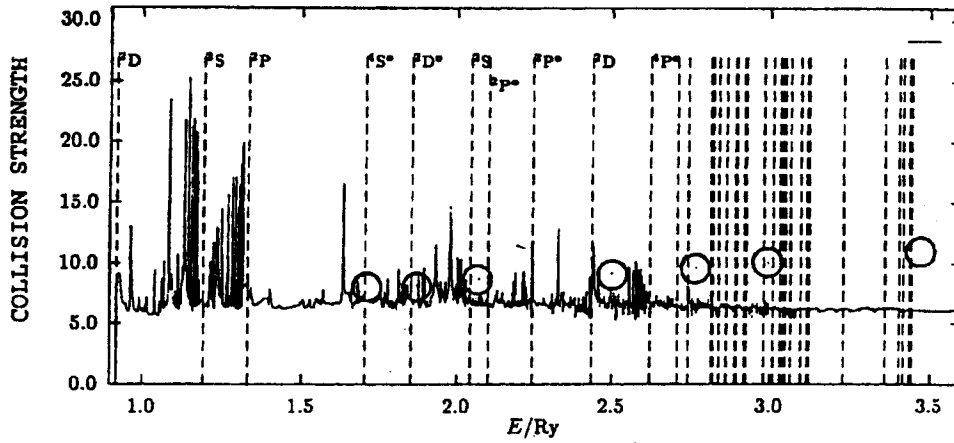


Figure 1 Collision strengths for the  $2s^2 2p^2 P^0 \rightarrow 2s 2p^2 ^2D$  transition in O III. Solid curve, *R*-matrix calculations (Ptascheck, 1994),  $\circ$ , this work.

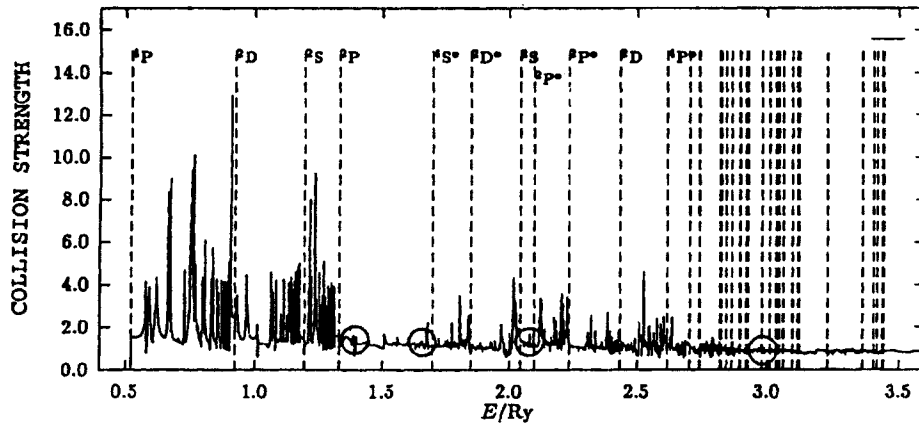


Figure 2 Collision strengths for the  $2s^2 2p^2 P^0 \rightarrow 2s 2p^2 ^4P$  transition in O III. Solid curve, *R*-matrix calculations (Ptascheck, 1994),  $\circ$ , this work.

## 6 COMPARATIVE STUDY OF THE CROSS-SECTIONS FOR C, N, AND O IONS

We have performed rather extensive calculations of the cross-sections for 57 direct and 27 exchange transitions for different ions of the C, N, O atoms. The results were grouped in triads to compare the cross-sections for the same transition in isoelectronic sequences comprising C, N and O ions. For carbon and oxygen our results can be compared with recommended data (Itikava *et al.*, 1985) which, as a rule, were obtained with better wavefunctions or with more refined approximations. The typical picture arising from such comparisons is shown in Figure 3.

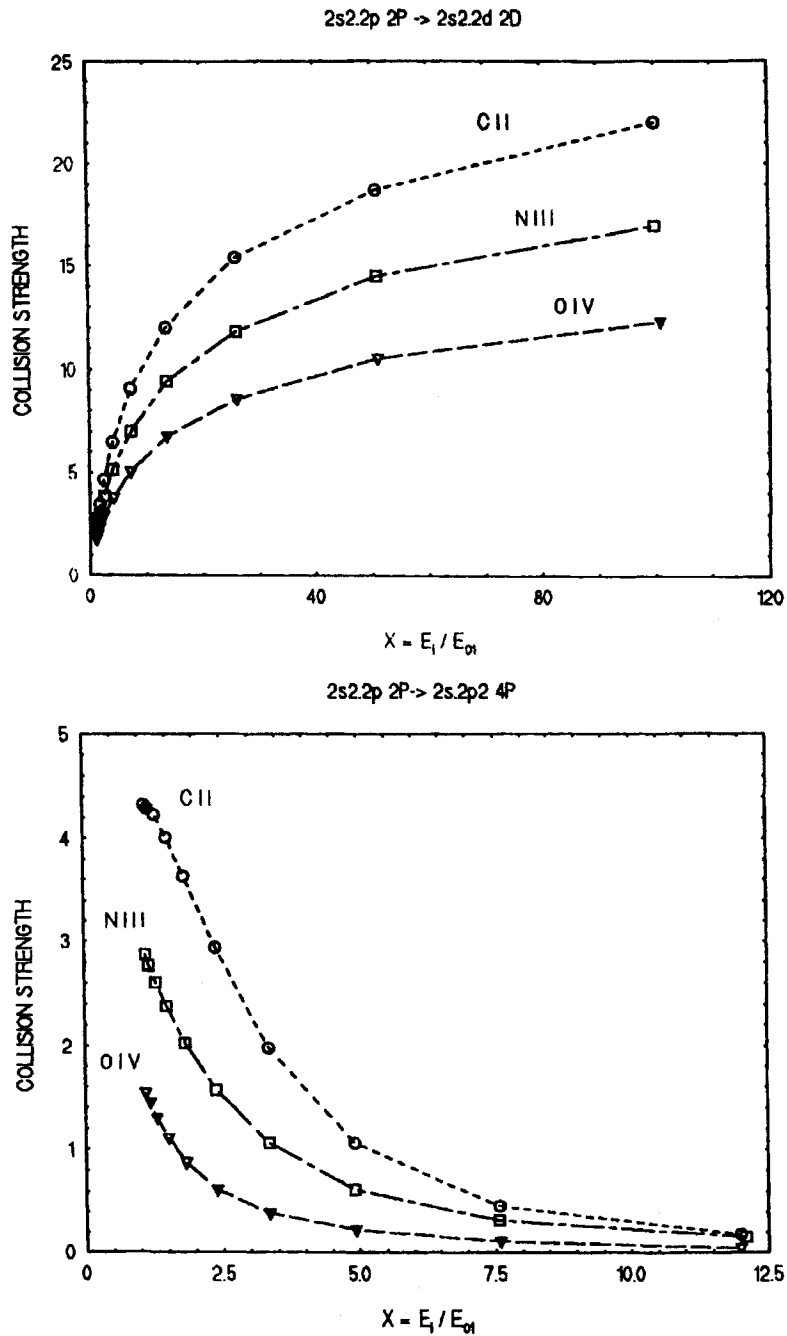


Figure 3 Collision strengths for the direct  $2s^2 2p\ 2P^0 \rightarrow 2s^2 2p^2\ 2D$  and exchange  $2s^2 2p\ 2P^0 \rightarrow 2s^2 2p^2\ 4P$  transitions in C II, N III and O IV.



The main conclusion that we can draw from these calculations is again the quite satisfactory agreement of our results with those from the recommended data (typical discrepancy within 30 percent) and the important observation that almost always the dependence of the cross-section on the charge of the ion is monotonous. It should be noted that there are a few exceptions from this latter rule. But in such cases all three cross-sections are rather close to one another.

## 7 TABLES OF THE EXCITATION CROSS SECTIONS AND COLLISION STRENGTHS OF THE NITROGEN IONS IN THE COULOMB-BORN-EXCHANGE APPROXIMATION

The tables contain following data for all nitrogen ions from N II up to N VII: The name of the transition, the energies of the initial  $E_0$ , and the final states  $E_1$  (taken mostly from Bashkin and Stoner, 1975) and, for convenience, transition energy  $E_{01}$  (the threshold) in eV.

- The energy of the incoming electron in threshold units  $X$ ;
- The collision strengths  $STR$ ;
- The cross-sections  $SIG$  in units of  $\pi a_0^2$ ;
- The coefficients A, B, C, D, E of the approximation formula equation (5).

The typical accuracy of the approximation was 1–3 percent for direct transitions, and between 3 to 20 percent for exchange transitions.

Such a bigger discrepancy in the exchange case was observed for the cross-sections with nonmonotoneous behavior in the vicinity of the threshold, which, with typically sharp fall down of the cross sections, did not allow to obtain better accuracy. But we always preferred to retain the standard simple formula. A better accuracy of analytic approximation, if needed, always can be achieved applying the same formula in a narrower energy interval.

All calculations were performed for the energies from 1.1 up to 100 times the threshold energy for direct transitions and for 1.1 up to 12 times the threshold energy for the exchange transitions. In such an interval the exchange transitions decrease by about two orders of magnitude. For the direct transitions, to economize space, we give data only up to 50 thresholds which should be enough for most applications. To restore the rest the analytic formula equation (5) can be used, as its coefficients were obtained, and are valid, in the wider energy range.

It is worth also remembering that in the hydrogen approximation the combination

$$SNZ = STR n^2 Z^4$$

should tend to the final limit when  $n \rightarrow \infty$ . This property can be used for a quick evaluation of the collision strengths for transitions to the states with principal

Table 3.  $STR n^2 Z^4$  for transitions  $2s^2 2p^2 P^0 \rightarrow 2s^2 nd^2 D$  in N III

$X =$	1.10	1.40	4.15	7.29	13.54	25.95	50.97
$3d =$	0.545E+03	0.625E+03	0.125E+04	0.170E+04	0.228E+04	0.288E+04	0.350E+04
$4d =$	0.412E+03	0.456E+03	0.863E+03	0.114E+04	0.148E+04	0.184E+04	0.220E+04
$5d =$	0.339E+03	0.375E+03	0.704E+03	0.920E+03	0.119E+04	0.148E+04	0.178E+04
$6d =$	0.314E+03	0.346E+03	0.643E+03	0.850E+03	0.108E+04	0.134E+04	0.160E+04

quantum number  $n$  higher than those given in the tables. The rate and character of convergence of such a sequence can be different for different series, but usually for  $n > 5$  there is no problem obtaining a result of some 30 percent accuracy. In Table 3 we give an example of such an SNZ sequence.

For higher degrees of ionization, where the atomic field is more hydrogen-like and in Bashkin and Stoner (1975) a lot of energy levels are listed, we sometimes give the results up to  $n = 9$  to let the reader himself to study better this sort of extrapolation.

### 7.1 N II Direct Transitions

$2s^2 2p^2 3P \rightarrow 2s 2p^3 (2P) 3P^0$ $E_0 = 39.91$ $E_1 = 16.06$ $E_{01} = 23.85$ (eV)							
$X =$	1.10	1.20	1.40	1.79	2.59	4.16	
$STR =$	.413E+01	.449E+01	.520E+01	.645E+01	.859E+01	.116E+02	
$SIG =$	.239E+00	.238E+00	.236E+00	.228E+00	.210E+00	.177E+00	
$ABCDE =$	.293E+01	-.584E+01	.126E+02	-.603E+01	.667E+01		
$X =$	7.29	13.54	26.03	50.73			
$STR =$	.156E+02	.199E+02	.246E+02	.290E+02			
$SIG =$	.136E+00	.930E-01	.598E-01	.363E-01			
$2p^2 3P \rightarrow 2p 3s^3 P^0$ $E_0 = 29.59$ $E_1 = 11.12$ $E_{01} = 18.47$ (eV)							
$X =$	1.10	1.20	1.40	1.80	2.58	4.16	
$STR =$	.807E+00	.819E+00	.882E+00	.111E+01	.161E+01	.235E+01	
$SIG =$	.601E-01	.558E-01	.517E-01	.505E-01	.509E-01	.464E-01	
$ABCDE =$	-.110E+01	.109E+01	.127E+01	-.465E+00	.220E+01		
$X =$	7.31	13.53	26.04	50.84			
$STR =$	.342E+01	.471E+01	.615E+01	.758E+01			
$SIG =$	.384E-01	.285E-01	.193E-01	.122E-01			
$2p^2 3P \rightarrow 2p 4s^3 P^0$ $E_0 = 29.59$ $E_1 = 5.21$ $E_{01} = 24.38$ (eV)							
$X =$	1.10	1.20	1.40	1.80	2.58	4.14	
$STR =$	.157E+00	.145E+00	.147E+00	.180E+00	.252E+00	.358E+00	
$SIG =$	.885E-02	.749E-02	.653E-02	.623E-02	.606E-02	.536E-02	
$ABCDE =$	-.932E-01	.943E-01	.106E+00	.596E-01	.299E+00		
$X =$	7.30	13.53	26.00	50.86			
$STR =$	.512E+00	.693E+00	.892E+00	.109E+01			
$SIG =$	.435E-02	.317E-02	.213E-02	.133E-02			
$2p^2 3P \rightarrow 2p 5s^3 P^0$ $E_0 = 29.59$ $E_1 = 3.03$ $E_{01} = 26.57$ (eV)							
$X =$	1.10	1.20	1.40	1.80	2.59	4.18	
$STR =$	.593E-01	.534E-01	.526E-01	.643E-01	.879E-01	.123E+00	
$SIG =$	.307E-02	.253E-02	.214E-02	.204E-02	.193E-02	.168E-02	
$ABCDE =$	-.270E-01	.354E-01	.132E-01	.430E-01	.998E-01		

$X = 7.30 \quad 13.55 \quad 26.01 \quad 50.81$   
 $STR = .175E+00 \quad .236E+00 \quad .301E+00 \quad .367E+00$   
 $SIG = .136E-02 \quad .991E-03 \quad .659E-03 \quad .410E-03$

$2p^2\ ^3P \rightarrow 2p6s\ ^3P^0 \quad E_0 = 29.59 \quad E_1 = 1.97 \quad E_{01} = 27.62 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.58 \quad 4.16$   
 $STR = .284E-01 \quad .253E-01 \quad .246E-01 \quad .299E-01 \quad .399E-01 \quad .559E-01$   
 $SIG = .141E-02 \quad .115E-02 \quad .965E-03 \quad .911E-03 \quad .846E-03 \quad .735E-03$   
 $ABCDE = -.107E-01 \quad .113E-01 \quad .131E-01 \quad .174E-01 \quad .448E-01$   
 $X = 7.31 \quad 13.54 \quad 26.03 \quad 50.68$   
 $STR = .802E-01 \quad .107E+00 \quad .137E+00 \quad .166E+00$   
 $SIG = .600E-03 \quad .431E-03 \quad .288E-03 \quad .179E-03$

$2p^2\ ^3P \rightarrow 2p3p\ ^3D \quad E_0 = 29.59 \quad E_1 = 8.63 \quad E_{01} = 20.96 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .356E+00 \quad .339E+00 \quad .309E+00 \quad .290E+00 \quad .337E+00 \quad .438E+00$   
 $SIG = .233E-01 \quad .203E-01 \quad .160E-01 \quad .117E-01 \quad .940E-02 \quad .760E-02$   
 $ABCDE = .597E+00 \quad -.723E+00 \quad .542E-01 \quad .511E+00 \quad .000E+00$   
 $X = 7.30 \quad 13.55 \quad 26.00 \quad 51.04$   
 $STR = .518E+00 \quad .552E+00 \quad .567E+00 \quad .578E+00$   
 $SIG = .512E-02 \quad .294E-02 \quad .157E-02 \quad .816E-03$

$2p^2\ ^3P \rightarrow 2p4p\ ^3D \quad E_0 = 29.59 \quad E_1 = 4.38 \quad E_{01} = 25.21 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.59 \quad 4.16$   
 $STR = .117E+00 \quad .104E+00 \quad .854E-01 \quad .761E-01 \quad .913E-01 \quad .115E+00$   
 $SIG = .639E-02 \quad .517E-02 \quad .366E-02 \quad .254E-02 \quad .212E-02 \quad .166E-02$   
 $ABCDE = .145E+00 \quad -.100E+00 \quad -.208E+00 \quad .316E+00 \quad .000E+00$   
 $X = 7.30 \quad 13.56 \quad 26.01 \quad 50.75$   
 $STR = .131E+00 \quad .138E+00 \quad .140E+00 \quad .142E+00$   
 $SIG = .108E-02 \quad .609E-03 \quad .323E-03 \quad .168E-03$

$2p^2\ ^3P \rightarrow 2p3p\ ^3S \quad E_0 = 29.59 \quad E_1 = 8.63 \quad E_{01} = 20.96 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .320E+01 \quad .327E+01 \quad .333E+01 \quad .338E+01 \quad .345E+01 \quad .354E+01$   
 $SIG = .209E+00 \quad .196E+00 \quad .172E+00 \quad .136E+00 \quad .961E-01 \quad .614E-01$   
 $ABCDE = .406E+01 \quad -.315E+01 \quad .512E+01 \quad -.297E+01 \quad .000E+00$   
 $X = 7.30 \quad 13.55 \quad 26.00 \quad 51.04$   
 $STR = .372E+01 \quad .387E+01 \quad .390E+01 \quad .403E+01$   
 $SIG = .367E-01 \quad .206E-01 \quad .108E-01 \quad .569E-02$

$2p^2\ ^3P \rightarrow 2p3p\ ^3P \quad E_0 = 29.59 \quad E_1 = 8.63 \quad E_{01} = 20.96 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .320E+01 \quad .327E+01 \quad .333E+01 \quad .338E+01 \quad .345E+01 \quad .354E+01$   
 $SIG = .209E+00 \quad .196E+00 \quad .172E+00 \quad .136E+00 \quad .961E-01 \quad .614E-01$   
 $ABCDE = .406E+01 \quad -.315E+01 \quad .512E+01 \quad -.297E+01 \quad .000E+00$   
 $X = 7.30 \quad 13.55 \quad 26.00 \quad 51.04$   
 $STR = .372E+01 \quad .387E+01 \quad .390E+01 \quad .403E+01$   
 $SIG = .367E-01 \quad .206E-01 \quad .108E-01 \quad .569E-02$

$2p^2\ ^3P \rightarrow 2p4p\ ^3P \quad E_0 = 29.59 \quad E_1 = 4.38 \quad E_{01} = 25.21 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .832E+00 \quad .840E+00 \quad .839E+00 \quad .830E+00 \quad .830E+00 \quad .853E+00$   
 $SIG = .454E-01 \quad .419E-01 \quad .359E-01 \quad .277E-01 \quad .192E-01 \quad .123E-01$   
 $ABCDE = .961E+00 \quad -.702E+00 \quad .120E+01 \quad -.638E+00 \quad .000E+00$   
 $X = 7.30 \quad 13.56 \quad 26.01 \quad 50.75$   
 $STR = .885E+00 \quad .920E+00 \quad .931E+00 \quad .947E+00$   
 $SIG = .727E-02 \quad .406E-02 \quad .215E-02 \quad .112E-02$

EXCITATION OF NITROGEN IONS

$2p^2\ ^3P \rightarrow 2p3d\ ^3F^0$ $E_0 = 29.59$ $E_1 = 6.46$ $E_{01} = 23.13$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.385E+00	.337E+00	.282E+00	.244E+00	.228E+00	.237E+00
SIG	=	.229E-01	.183E-01	.132E-01	.888E-02	.577E-02	.372E-02
ABCDE	=	.290E+00	-.264E+00	.190E+00	.234E+00	-.208E-02	
X	=	7.31	13.53	26.03	51.02		
STR	=	.256E+00	.266E+00	.273E+00	.278E+00		
SIG	=	.229E-02	.129E-02	.687E-03	.356E-03		
$2p^2\ ^3P \rightarrow 2p4d\ ^3F^0$ $E_0 = 29.59$ $E_1 = 3.59$ $E_{01} = 26.00$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.15
STR	=	.153E+00	.128E+00	.103E+00	.881E-01	.812E-01	.811E-01
SIG	=	.809E-02	.622E-02	.429E-02	.285E-02	.183E-02	.113E-02
ABCDE	=	.943E-01	-.501E-01	-.372E-01	.178E+00	.740E-03	
X	=	7.31	13.54	26.03	50.76		
STR	=	.892E-01	.926E-01	.954E-01	.961E-01		
SIG	=	.710E-03	.398E-03	.213E-03	.110E-03		
$2p^2\ ^3P \rightarrow 2p3d\ ^3D^0$ $E_0 = 29.59$ $E_1 = 6.36$ $E_{01} = 23.23$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.249E+01	.260E+01	.289E+01	.361E+01	.502E+01	.719E+01
SIG	=	.147E+00	.141E+00	.134E+00	.131E+00	.126E+00	.112E+00
ABCDE	=	-.167E+01	.106E+01	.551E+01	-.258E+01	.584E+01	
X	=	7.32	13.55	25.99	50.78		
STR	=	.101E+02	.137E+02	.175E+02	.213E+02		
SIG	=	.899E-01	.656E-01	.438E-01	.273E-01		
$2p^2\ ^3P \rightarrow 2p4d\ ^3D^0$ $E_0 = 29.59$ $E_1 = 3.53$ $E_{01} = 26.06$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.14
STR	=	.925E+00	.952E+00	.104E+01	.130E+01	.180E+01	.256E+01
SIG	=	.487E-01	.460E-01	.432E-01	.419E-01	.403E-01	.358E-01
ABCDE	=	-.234E+00	-.281E+00	.224E+01	-.834E+00	.193E+01	
X	=	7.29	13.54	26.01	51.03		
STR	=	.359E+01	.479E+01	.607E+01	.738E+01		
SIG	=	.286E-01	.205E-01	.135E-01	.839E-02		
$2p^2\ ^3P \rightarrow 2p5d\ ^3D^0$ $E_0 = 29.59$ $E_1 = 2.24$ $E_{01} = 27.35$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.17
SIG	=	.430E+00	.443E+00	.484E+00	.601E+00	.833E+00	.119E+01
STR	=	.216E-01	.204E-01	.191E-01	.185E-01	.178E-01	.158E-01
ABCDE	=	-.718E-01	-.976E-01	.807E+00	-.213E+00	.875E+00	
X	=	7.31	13.56	26.02	50.81		
SIG	=	.167E+01	.221E+01	.279E+01	.335E+01		
STR	=	.126E-01	.899E-02	.592E-02	.365E-02		
$2p^2\ ^3P \rightarrow 2p3d\ ^3P^0$ $E_0 = 29.59$ $E_1 = 6.18$ $E_{01} = 23.41$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.16
STR	=	.182E+01	.191E+01	.214E+01	.271E+01	.383E+01	.560E+01
SIG	=	.107E+00	.103E+00	.991E-01	.975E-01	.958E-01	.869E-01
ABCDE	=	-.155E+01	.127E+01	.327E+01	-.124E+01	.470E+01	
X	=	7.30	13.54	26.00	50.81		
STR	=	.806E+01	.108E+02	.138E+02	.170E+02		
SIG	=	.712E-01	.514E-01	.343E-01	.215E-01		
$2p^2\ ^3P \rightarrow 2p4d\ ^3P^0$ $E_0 = 29.59$ $E_1 = 3.47$ $E_{01} = 26.12$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.58	4.17
STR	=	.757E+00	.780E+00	.867E+00	.109E+01	.154E+01	.221E+01
SIG	=	.399E-01	.377E-01	.359E-01	.350E-01	.344E-01	.306E-01
ABCDE	=	-.286E+00	-.186E+00	.191E+01	-.717E+00	.172E+01	

$X$	=	7.31	13.55	26.03	50.91		
$STR$	=	.314E+01	.418E+01	.532E+01	.647E+01		
$SIG$	=	.249E-01	.179E-01	.118E-01	.736E-02		
$2p^2 3P \rightarrow 2p5d^3P^0 \quad E_0 = 29.59 \quad E_1 = 2.24 \quad E_{01} = 27.35 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.17
$STR$	=	.430E+00	.443E+00	.484E+00	.601E+00	.833E+00	.119E+01
$SIG$	=	.216E-01	.204E-01	.191E-01	.185E-01	.178E-01	.158E-01
$ABCDE$	=	-.718E-01	-.976E-01	.807E+00	-.213E+00	.875E+00	
$X$	=	7.31	13.56	26.02	50.81		
$STR$	=	.167E+01	.221E+01	.279E+01	.335E+01		
$SIG$	=	.126E-01	.899E-02	.592E-02	.365E-02		
$2p^2 3P \rightarrow 2p4f^3F \quad E_0 = 29.59 \quad E_1 = 3.42 \quad E_{01} = 26.17 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.287E-01	.283E-01	.290E-01	.328E-01	.422E-01	.573E-01
$SIG$	=	.151E-02	.136E-02	.120E-02	.106E-02	.943E-03	.795E-03
$ABCDE$	=	.887E-01	-.148E+00	.766E-01	.158E-01	.000E+00	
$X$	=	7.30	13.56	26.02	50.82		
$STR$	=	.718E-01	.800E-01	.833E-01	.849E-01		
$SIG$	=	.568E-03	.340E-03	.185E-03	.965E-04		
$2s^2 2p^2 1D \rightarrow 2s2p^3 1P^0 \quad E_0 = 39.91 \quad E_1 = 14.17 \quad E_{01} = 25.75 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.442E+01	.521E+01	.685E+01	.989E+01	.148E+02	.214E+02
$SIG$	=	.425E+00	.459E+00	.518E+00	.583E+00	.605E+00	.543E+00
$ABCDE$	=	.420E+03	-.105E+02	.147E+02	-.491E+01	.133E+02	
$X$	=	7.30	13.55	26.02	50.87		
$STR$	=	.296E+02	.318E+02	.474E+02	.566E+02		
$SIG$	=	.429E+00	.297E+00	.193E+00	.118E+00		
$2p^2 1D \rightarrow 2p3s^3P^0 \quad E_0 = 27.71 \quad E_1 = 11.11 \quad E_{01} = 16.60 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.507E+00	.538E+00	.614E+00	.809E+00	.119E+01	.178E+01
$SIG$	=	.754E-01	.736E-01	.721E-01	.739E-01	.756E-01	.703E-01
$ABCDE$	=	-.613E+00	-.411E-01	.222E+01	-.111E+01	.162E+01	
$X$	=	7.29	13.55	26.03	50.85		
$STR$	=	.260E+01	.362E+01	.466E+01	.574E+01		
$SIG$	=	.586E-01	.438E-01	.294E-01	.185E-01		
$2p^2 1D \rightarrow 2p4s^1P^0 \quad E_0 = 27.71 \quad E_1 = 5.07 \quad E_{01} = 22.63 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.512E-01	.499E-01	.541E-01	.760E-01	.124E+00	.199E+00
$SIG$	=	.560E-02	.500E-02	.465E-02	.509E-02	.576E-02	.574E-02
$ABCDE$	=	-.303E-01	-.988E-01	.226E+00	-.431E-01	.168E+00	
$X$	=	7.29	13.56	26.02	50.81		
$STR$	=	.289E+00	.401E+00	.516E+00	.629E+00		
$SIG$	=	.477E-02	.356E-02	.238E-02	.149E-02		
$2p^2 1D \rightarrow 2p5s^1P^0 \quad E_0 = 27.71 \quad E_1 = 2.97 \quad E_{01} = 24.74 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.182E-01	.169E-01	.182E-01	.257E-01	.430E-01	.696E-01
$SIG$	=	.182E-02	.155E-02	.143E-02	.157E-02	.183E-02	.184E-02
$ABCDE$	=	-.560E-02	-.405E-01	.656E-01	.101E-02	.568E-01	
$X$	=	7.30	13.56	26.02	50.82		
$STR$	=	.103E+00	.140E+00	.179E+00	.218E+00		
$SIG$	=	.154E-02	.113E-02	.754E-03	.471E-03		

$2p^2\ ^1D \rightarrow 2p3p\ ^1P$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.878E-01	.882E-01	.890E-01	.947E-01	.114E+00	.148E+00
$SIG$	=	.113E-01	.104E-01	.900E-02	.747E-02	.624E-02	.505E-02
$ABCDE$	=	.231E+00	-.405E+00	.315E+00	-.432E-01	.000E+00	
$X$	=	7.27	13.56	26.03	50.87		
$STR$	=	.186E+00	.207E+00	.217E+00	.221E+00		
$SIG$	=	.362E-02	.216E-02	.118E-02	.613E-03		
$2p^2\ ^1D \rightarrow 2p4p\ ^1P$ $E_0 = 27.71$ $E_1 = 4.32$ $E_{01} = 23.39$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.268E-01	.253E-01	.232E-01	.234E-01	.286E-01	.372E-01
$SIG$	=	.284E-02	.245E-02	.193E-02	.152E-02	.129E-02	.104E-02
$ABCDE$	=	.554E-01	-.831E-01	.305E-01	.298E-01	.000E+00	
$X$	=	7.30	13.56	26.02	50.82		
$STR$	=	.461E-01	.505E-01	.524E-01	.532E-01		
$SIG$	=	.734E-03	.433E-03	.235E-03	.122E-03		
$2p^2\ ^1D \rightarrow 2p3p\ ^1D$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.201E+01	.206E+01	.211E+01	.216E+01	.220E+01	.228E+01
$SIG$	=	.258E+00	.243E+00	.214E+00	.171E+00	.120E+00	.775E-01
$ABCDE$	=	.263E+01	-.209E+01	.324E+01	-.187E+01	.000E+00	
$X$	=	7.27	13.56	26.03	50.87		
$STR$	=	.242E+01	.250E+01	.256E+01	.259E+01		
$SIG$	=	.471E-01	.261E-01	.139E-01	.719E-02		
$2p^2\ ^1D \rightarrow 2p4p\ ^1D$ $E_0 = 27.71$ $E_1 = 4.32$ $E_{01} = 23.39$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.513E+00	.521E+00	.523E+00	.520E+00	.522E+00	.536E+00
$SIG$	=	.543E-01	.504E-01	.435E-01	.337E-01	.235E-01	.150E-01
$ABCDE$	=	.615E+00	-.508E+00	.878E+00	-.486E+00	.000E+00	
$X$	=	7.31	13.55	25.99	50.87		
$STR$	=	.563E+00	.583E+00	.592E+00	.604E+00		
$SIG$	=	.896E-02	.501E-02	.265E-02	.138E-02		
$2p^2\ ^1D \rightarrow 2p3p\ ^1S$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.390E-01	.392E-01	.395E-01	.421E-01	.506E-01	.660E-01
$SIG$	=	.501E-02	.462E-02	.400E-02	.332E-02	.277E-02	.224E-02
$ABCDE$	=	.102E+00	-.180E+00	.140E+00	-.192E-01	.000E+00	
$X$	=	7.27	13.56	26.03	50.87		
$STR$	=	.827E-01	.920E-01	.964E-01	.981E-01		
$SIG$	=	.161E-02	.959E-03	.523E-03	.273E-03		
$2p^2\ ^1D \rightarrow 2p4p\ ^1S$ $E_0 = 27.71$ $E_1 = 4.32$ $E_{01} = 23.39$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.119E-01	.113E-01	.103E-01	.104E-01	.127E-01	.165E-01
$SIG$	=	.126E-02	.109E-02	.860E-03	.674E-03	.572E-03	.463E-03
$ABCDE$	=	.246E-01	-.369E-01	.136E-01	.132E-01	.000E+00	
$X$	=	7.31	13.55	25.99	50.87		
$STR$	=	.205E-01	.224E-01	.233E-01	.237E-01		
$SIG$	=	.326E-03	.193E-03	.104E-03	.541E-04		
$2p^2\ ^1D \rightarrow 2p3d\ ^1D^0$ $E_0 = 27.71$ $E_1 = 6.41$ $E_{01} = 21.30$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.412E+00	.418E+00	.446E+00	.547E+00	.757E+00	.109E+01
$SIG$	=	.479E-01	.444E-01	.408E-01	.389E-01	.374E-01	.336E-01
$ABCDE$	=	-.599E-01	-.256E+00	.990E+00	-.292E+00	.810E+00	

$X$	=	7.28	13.57	26.01	50.70		
$STR$	=	.153E+01	.204E+01	.259E+01	.311E+01		
$SIG$	=	.269E-01	.192E-01	.127E-01	.783E-02		
$2p^2^1D \rightarrow 2p4d^1D^0$ $E_0 = 27.71$ $E_1 = 3.58$ $E_{01} = 24.13$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.14
$STR$	=	.156E+00	.156E+00	.163E+00	.195E+00	.271E+00	.385E+00
$SIG$	=	.160E-01	.146E-01	.131E-01	.123E-01	.118E-01	.105E-01
$ABCDE$	=	.420E-01	-.190E+00	.397E+00	-.876E-01	.259E+00	
$X$	=	7.29	13.55	26.02	50.97		
$STR$	=	.538E+00	.702E+00	.881E+00	.106E+01		
$SIG$	=	.832E-02	.585E-02	.382E-02	.234E-02		
$2p^2^1D \rightarrow 2p5d^1D^0$ $E_0 = 27.71$ $E_1 = 2.26$ $E_{01} = 25.44$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.17
$STR$	=	.738E-01	.722E-01	.748E-01	.894E-01	.125E+00	.177E+00
$SIG$	=	.718E-02	.644E-02	.572E-02	.532E-02	.515E-02	.455E-02
$ABCDE$	=	.244E-01	-.774E-01	.132E+00	-.666E-03	.115E+00	
$X$	=	7.31	13.56	26.02	50.70		
$STR$	=	.246E+00	.319E+00	.398E+00	.476E+00		
$SIG$	=	.359E-02	.251E-02	.164E-02	.100E-02		
$2p^2^1D \rightarrow 2p3d^1F^0$ $E_0 = 27.71$ $E_1 = 6.13$ $E_{01} = 21.58$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.116E+01	.123E+01	.140E+01	.183E+01	.265E+01	.392E+01
$SIG$	=	.133E+00	.129E+00	.126E+00	.129E+00	.129E+00	.119E+00
$ABCDE$	=	-.122E+01	.861E+00	.250E+01	-.107E+01	.338E+01	
$X$	=	7.28	13.53	26.00	50.98		
$STR$	=	.562E+01	.763E+01	.986E+01	.121E+02		
$SIG$	=	.974E-01	.711E-01	.478E-01	.299E-01		
$2p^2^1D \rightarrow 2p4d^1F^0$ $E_0 = 27.71$ $E_1 = 3.43$ $E_{01} = 24.28$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.971E-01	.968E-01	.105E+00	.132E+00	.189E+00	.277E+00
$SIG$	=	.989E-02	.905E-02	.844E-02	.824E-02	.820E-02	.747E-02
$ABCDE$	=	-.722E-02	-.473E-01	.153E+00	.199E-02	.201E+00	
$X$	=	7.29	13.55	26.03	50.66		
$STR$	=	.390E+00	.513E+00	.649E+00	.783E+00		
$SIG$	=	.599E-02	.424E-02	.280E-02	.173E-02		
$2p^2^1D \rightarrow 2p5d^1F^0$ $E_0 = 27.71$ $E_1 = 2.18$ $E_{01} = 25.52$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.446E-01	.442E-01	.476E-01	.598E-01	.867E-01	.127E+00
$SIG$	=	.432E-02	.393E-02	.363E-02	.355E-02	.358E-02	.326E-02
$ABCDE$	=	-.141E-02	-.176E-01	.468E-01	.194E-01	.911E-01	
$X$	=	7.29	13.56	26.02	50.94		
$STR$	=	.178E+00	.234E+00	.295E+00	.357E+00		
$SIG$	=	.260E-02	.184E-02	.121E-02			
$2p^2^1D \rightarrow 2p3d^1P^0$ $E_0 = 27.71$ $E_1 = 6.05$ $E_{01} = 21.66$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.531E-01	.484E-01	.450E-01	.488E-01	.638E-01	.888E-01
$SIG$	=	.607E-02	.507E-02	.404E-02	.341E-02	.310E-02	.268E-02
$ABCDE$	=	.626E-01	-.937E-01	.241E-01	.706E-01	.323E-01	
$X$	=	7.30	13.53	26.00	50.80		
$STR$	=	.116E+00	.140E+00	.164E+00	.187E+00		
$SIG$	=	.200E-02	.130E-02	.791E-03	.463E-03		

$2p^2^1D \rightarrow 2p4d^1P^0$ $E_0 = 27.71$ $E_1 = 3.40$ $E_{01} = 24.31$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.16
STR	=	.223E-01	.196E-01	.174E-01	.182E-01	.241E-01	.335E-01
SIG	=	.227E-02	.182E-02	.139E-02	.114E-02	.104E-02	.903E-03
ABCDE	=	.260E-01	-.389E-01	.219E-02	.385E-01	.115E-01	
X	=	7.28	13.54	26.01	51.03		
STR	=	.444E-01	.527E-01	.614E-01	.703E-01		
SIG	=	.682E-03	.436E-03	.264E-03	.154E-03		
$2p^2^1D \rightarrow 2p5d^1P^0$ $E_0 = 27.71$ $E_1 = 2.18$ $E_{01} = 25.53$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.15
STR	=	.113E-01	.967E-02	.840E-02	.871E-02	.115E-01	.161E-01
SIG	=	.109E-02	.860E-03	.640E-03	.518E-03	.475E-03	.414E-03
ABCDE	=	.127E-01	-.186E-01	-.205E-02	.222E-01	.541E-02	
X	=	7.29	13.56	26.01	50.93		
STR	=	.212E-01	.254E-01	.295E-01	.336E-01		
SIG	=	.310E-03	.200E-03	.121E-03	.704E-04		

7.2 N II Exchange Transitions

$2s^22p^2^3P \rightarrow 2s2p^3(^2P)^1P^0$ $E_0 = 39.91$ $E_1 = 28.76$ $E_{01} = 11.15$ (eV)							
X	=	1.10	1.17	1.29	1.50	1.83	2.39
STR	=	.612E+00	.621E+00	.632E+00	.645E+00	.647E+00	.624E+00
SIG	=	.752E-01	.717E-01	.663E-01	.584E-01	.479E-01	
ABCDE	=	.289E+04	.955E+03	-.102E+05	.771E+04	.000E+00	
X	=	3.34	4.92	7.58	12.02		
STR	=	.553E+00	.413E+00	.239E+00	.101E+00		
SIG	=	.353E-01	.225E-01	.114E-01	.428E-02	.114E-02	
$2p^2^3P \rightarrow 2p3s^1P^0$ $E_0 = 20.08$ $E_1 = 9.67$ $E_{01} = 0.41$ (eV)							
X	=	1.10	1.17	1.30	1.50	1.83	2.39
STR	=	.212E+00	.209E+00	.209E+00	.214E+00	.217E+00	.199E+00
SIG	=	.279E-01	.259E-01	.234E-01	.207E-01	.172E-01	.121E-01
ABCDE	=	.164E+03	.116E+04	-.308E+04	.190E+04	.000E+00	
RAT	=	.91	1.05	1.11	1.03	.95	.95
X	=	3.33	4.92	7.58	12.01		
STR	=	.147E+00	.815E-01	.348E-01	.126E-01		
SIG	=	.640E-02	.241E-02	.668E-03	.152E-03		
RAT	=	1.01	1.05	1.02	.95		
$2p^2^3P \rightarrow 2p4s^1P^0$ $E_0 = 20.08$ $E_1 = 4.77$ $E_{01} = 15.31$ (eV)							
X	=	1.10	1.18	1.29	1.50	1.83	2.40
STR	=	.614E-01	.610E-01	.623E-01	.649E-01	.625E-01	.503E-01
SIG	=	.549E-02	.513E-02	.476E-02	.428E-02	.338E-02	.207E-02
ABCDE	=	.243E+02	.522E+03	-.116E+04	.656E+03	.000E+00	
RAT	=	.95	1.04	1.05	1.00	.97	.99
X	=	3.34	4.92	7.57	12.01		
STR	=	.303E-01	.139E-01	.516E-02	.165E-02		
SIG	=	.897E-03	.278E-03	.672E-04	.135E-04		
RAT	=	1.01	1.01	1.01	.98		
$2p^2^3P \rightarrow 2p5s^1P^0$ $E_0 = 20.08$ $E_1 = 2.84$ $E_{01} = 17.25$ (eV)							
X	=	1.10	1.18	1.29	1.50	1.83	2.39
STR	=	.266E-01	.267E-01	.275E-01	.284E-01	.268E-01	.202E-01
SIG	=	.211E-02	.199E-02	.186E-02	.167E-02	.128E-02	.740E-03
ABCDE	=	.820E+01	.239E+03	-.507E+03	.276E+03	.000E+00	



$X$	=	3.34	4.92	7.60	12.06		
$STR$	=	.114E-01	.494E-02	.180E-02	.542E-03		
$SIG$	=	.300E-03	.879E-04	.207E-04	.394E-05		

$2p^2\ ^3P \rightarrow 2p3p\ ^1P$ $E_0 = 20.08$ $E_1 = 7.58$ $E_{01} = 12.50$ (eV)							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.701E-01	.609E-01	.501E-01	.409E-01	.401E-01	.494E-01
$SIG$	=	.768E-02	.627E-02	.468E-02	.331E-02	.265E-02	.250E-02
$ABCDE$	=	.396E+03	-.110E+04	.878E+03	-.115E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.00		
$STR$	=	.560E-01	.469E-01	.279E-01	.115E-01		
$SIG$	=	.203E-02	.115E-02	.445E-03	.116E-03		

$2p^2\ ^3P \rightarrow 2p4p\ ^1P$ $E_0 = 20.08$ $E_1 = 4.01$ $E_{01} = 16.08$ (eV)							
$X$	=	1.11	1.18	1.29	1.49	1.83	2.40
$STR$	=	.257E-01	.209E-01	.161E-01	.135E-01	.153E-01	.192E-01
$SIG$	=	.218E-02	.167E-02	.117E-02	.851E-03	.784E-03	.754E-03
$ABCDE$	=	.104E+03	-.193E+02	-.484E+03	.442E+03	.000E+00	
$X$	=	3.34	4.92	7.59	12.01		
$STR$	=	.191E-01	.136E-01	.670E-02	.221E-02		
$SIG$	=	.540E-03	.260E-03	.831E-04	.173E-04		

$2p^2\ ^3P \rightarrow 2p3p\ ^1D$ $E_0 = 20.08$ $E_1 = 7.58$ $E_{01} = 12.50$ (eV)							
$X$	=	1.11	1.18	1.30	1.50	1.83	2.39
$STR$	=	.103E+00	.874E-01	.693E-01	.532E-01	.503E-01	.643E-01
$SIG$	=	.113E-01	.898E-02	.647E-02	.430E-02	.332E-02	.325E-02
$ABCDE$	=	.517E+03	-.134E+04	.860E+03	.616E+02	.000E+00	
$X$	=	3.34	4.92	7.58	12.00		
$STR$	=	.759E-01	.642E-01	.377E-01	.150E-01		
$SIG$	=	.275E-02	.158E-02	.602E-03	.152E-03		

$2p^2\ ^3P \rightarrow 2p4p\ ^1D$ $E_0 = 20.08$ $E_1 = 4.01$ $E_{01} = 16.08$ (eV)							
$X$	=	1.11	1.18	1.29	1.49	1.83	2.40
$STR$	=	.358E-01	.285E-01	.212E-01	.175E-01	.204E-01	.265E-01
$SIG$	=	.304E-02	.228E-02	.154E-02	.110E-02	.105E-02	.104E-02
$ABCDE$	=	.129E+03	.722E+02	-.866E+03	.729E+03	.000E+00	
$X$	=	3.34	4.92	7.59	12.01		
$STR$	=	.266E-01	.188E-01	.902E-02	.282E-02		
$SIG$	=	.752E-03	.359E-03	.112E-03	.221E-04		

$2p^2\ ^3P \rightarrow 2p3d\ ^1D^0$ $E_0 = 20.08$ $E_1 = 6.10$ $E_{01} = 13.99$ (eV)							
$X$	=	1.11	1.17	1.29	1.49	1.83	2.40
$STR$	=	.342E+00	.340E+00	.333E+00	.307E+00	.256E+00	.178E+00
$SIG$	=	.335E-01	.314E-01	.278E-01	.222E-01	.151E-01	.801E-02
$ABCDE$	=	.814E+01	.162E+04	-.291E+04	.144E+04	.000E+00	
$X$	=	3.34	4.92	7.58	12.01		
$STR$	=	.977E-01	.419E-01	.143E-01	.387E-02		
$SIG$	=	.316E-02	.920E-03	.205E-03	.348E-04		

$2p^2\ ^3P \rightarrow 2p4d\ ^1D^0$ $E_0 = 20.08$ $E_1 = 3.43$ $E_{01} = 16.55$ (eV)							
$X$	=	1.11	1.18	1.30	1.50	1.83	2.40
$STR$	=	.132E+00	.133E+00	.131E+00	.122E+00	.999E-01	.671E-01
$SIG$	=	.109E-01	.103E-01	.919E-02	.740E-02	.495E-02	.254E-02
$ABCDE$	=	-.773E+01	.804E+03	-.144E+04	.711E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.01		
$STR$	=	.351E-01	.144E-01	.459E-02	.113E-02		
$SIG$	=	.954E-03	.266E-03	.551E-04	.851E-05		

$2p^2\ ^3P \rightarrow 2p5d\ ^1D^0$ $E_0 = 20.08$ $E_1 = 2.19$ $E_{01} = 17.89$ (eV)							
X	=	1.11	1.17	1.30	1.49	1.83	2.39
STR	=	.649E-01	.650E-01	.644E-01	.597E-01	.488E-01	.323E-01
SIG	=	.496E-02	.468E-02	.420E-02	.338E-02	.225E-02	.114E-02
ABCDE	=	-.562E+01	.427E+03	-.767E+03	.377E+03	.000E+00	
X	=	3.34	4.92	7.60	12.02		
STR	=	.166E-01	.657E-02	.210E-02	.484E-03		
SIG	=	.419E-03	.113E-03	.234E-04	.341E-05		
$2p^2\ ^3P \rightarrow 2p3d\ ^1F^0$ $E_0 = 20.08$ $E_1 = 6.10$ $E_{01} = 13.99$ (eV)							
X	=	1.11	1.17	1.29	1.49	1.83	2.40
STR	=	.231E+00	.224E+00	.215E+00	.196E+00	.162E+00	.113E+00
SIG	=	.227E-01	.207E-01	.179E-01	.142E-01	.958E-02	.508E-02
ABCDE	=	-.404E+02	.126E+04	-.224E+04	.113E+04	.000E+00	
X	=	3.34	4.92	7.58	12.01		
STR	=	.607E-01	.243E-01	.721E-02	.157E-02		
SIG	=	.197E-02	.535E-03	.103E-03	.141E-04		
$2p^2\ ^3P \rightarrow 2p4d\ ^1F^0$ $E_0 = 20.08$ $E_1 = 3.43$ $E_{01} = 16.65$ (eV)							
X	=	1.11	1.18	1.30	1.50	1.83	2.40
STR	=	.811E-01	.799E-01	.780E-01	.730E-01	.611E-01	.418E-01
SIG	=	.666E-02	.616E-02	.546E-02	.443E-02	.303E-02	.158E-02
ABCDE	=	-.243E+02	.609E+03	-.110E+04	.554E+03	.000E+00	
X	=	3.34	4.92	7.57	12.01		
STR	=	.215E-01	.829E-02	.228E-02	.446E-03		
SIG	=	.585E-03	.153E-03	.274E-04	.337E-05		
$2p^2\ ^3P \rightarrow 2p5d\ ^1F^0$ $E_0 = 20.08$ $E_1 = 2.19$ $E_{01} = 17.89$ (eV)							
X	=	1.11	1.17	1.30	1.49	1.83	2.39
STR	=	.384E-01	.377E-01	.373E-01	.352E-01	.296E-01	.199E-01
SIG	=	.293E-02	.272E-02	.243E-02	.199E-02	.137E-02	.701E-03
ABCDE	=	-.133E+02	.320E+03	-.579E+03	.292E+03	.000E+00	
X	=	3.34	4.92	7.60	12.02		
STR	=	.101E-01	.378E-02	.104E-02	.189E-03		
SIG	=	.257E-03	.649E-04	.116E-04	.133E-05		
$2p^2\ ^3P \rightarrow 2p3d\ ^1P^0$ $E_0 = 20.08$ $E_1 = 6.10$ $E_{01} = 13.99$ (eV)							
X	=	1.11	1.17	1.29	1.49	1.83	2.40
STR	=	.753E-01	.760E-01	.751E-01	.698E-01	.582E-01	.404E-01
SIG	=	.740E-02	.701E-02	.628E-02	.505E-02	.344E-02	.182E-02
ABCDE	=	.944E+01	.330E+03	-.597E+03	.292E+03	.000E+00	
X	=	3.34	4.92	7.58	12.01		
STR	=	.224E-01	.990E-02	.358E-02	.103E-02		
SIG	=	.727E-03	.217E-03	.510E-04	.924E-05		
$2p^2\ ^3P \rightarrow 2p4d\ ^1P^0$ $E_0 = 20.08$ $E_1 = 3.43$ $E_{01} = 16.65$ (eV)							
X	=	1.11	1.18	1.30	1.50	1.83	2.40
STR	=	.306E-01	.311E-01	.308E-01	.285E-01	.231E-01	.154E-01
SIG	=	.252E-02	.240E-02	.215E-02	.173E-02	.115E-02	.583E-03
ABCDE	=	.147E+01	.166E+03	-.298E+03	.145E+03	.000E+00	
X	=	3.34	4.92	7.57	12.01		
STR	=	.810E-02	.343E-02	.115E-02	.301E-03		
SIG	=	.220E-03	.633E-04	.138E-04	.228E-05		
$2p^2\ ^3P \rightarrow 2p5d\ ^1P^0$ $E_0 = 20.08$ $E_1 = 2.19$ $E_{01} = 17.89$ (eV)							
X	=	1.11	1.17	1.30	1.49	1.83	2.39
STR	=	.152E-01	.154E-01	.153E-01	.140E-01	.113E-01	.745E-02
SIG	=	.116E-02	.111E-02	.995E-03	.794E-03	.523E-03	.263E-03
ABCDE	=	.345E+00	.888E+02	-.159E+03	.770E+02	.000E+00	

$X$	=	3.34	4.92	7.60	12.02		
$STR$	=	.383E-02	.156E-02	.527E-03	.130E-03		
$SIG$	=	.969E-04	.568E-04	.586E-05	.914E-06		
$2p^2\ ^1D \rightarrow 2p3s\ ^3P^0$ $E_0 = 27.71$ $E_1 = 11.12$ $E_{01} = 16.59$ (eV)							
$X$	=	1.11	1.18	1.30	1.50	1.83	2.39
$STR$	=	.200E+00	.184E+00	.167E+00	.156E+00	.155E+00	.150E+00
$SIG$	=	.298E-01	.257E-01	.212E-01	.171E-01	.138E-01	
$ABCDE$	=	.260E+03	.263E+04	-.729E+04	.477E+04	.000E+00	
$X$	=	3.34	4.92	7.60	12.06		
$STR$	=	.120E+00	.682E-01	.278E-01	.852E-02		
$SIG$	=	.103E-01	.588E-02	.228E-02	.600E-03	.116E-03	
$2p^2\ ^1D \rightarrow 2p4s\ ^3P^0$ $E_0 = 27.71$ $E_1 = 5.21$ $E_{01} = 22.49$ (eV)							
$X$	=	1.11	1.17	1.29	1.49	1.83	2.39
$STR$	=	.567E-01	.506E-01	.458E-01	.444E-01	.449E-01	.394E-01
$SIG$	=	.622E-02	.522E-02	.428E-02	.359E-02	.296E-02	.199E-02
$ABCDE$	=	.849E+02	.703E+03	-.186E+04	.116E+04	.000E+00	
$X$	=	3.34	4.93	7.56	12.05		
$STR$	=	.262E-01	.122E-01	.414E-02	.187E-02		
$SIG$	=	.950E-03	.300E-03	.663E-04	.188E-04		
$2p^2\ ^1D \rightarrow 2p5s\ ^3P^0$ $E_0 = 27.71$ $E_1 = 3.02$ $E_{01} = 24.69$ (eV)							
$X$	=	1.11	1.17	1.30	1.50	1.83	2.39
$STR$	=	.241E-01	.215E-01	.197E-01	.194E-01	.193E-01	.162E-01
$SIG$	=	.241E-02	.202E-02	.168E-02	.143E-02	.116E-02	.747E-03
$ABCDE$	=	.344E+02	.304E+03	-.769E+03	.462E+03	.000E+00	
$X$	=	3.34	4.90	7.58	12.03		
$STR$	=	.100E-01	.439E-02	.146E-02	.679E-03		
$SIG$	=	.331E-03	.988E-04	.213E-04	.622E-05		
$2p^2\ ^1D \rightarrow 2p6s\ ^3P^0$ $E_0 = 27.71$ $E_1 = 1.97$ $E_{01} = 25.74$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.39
$STR$	=	.126E-01	.114E-01	.105E-01	.104E-01	.101E-01	.828E-02
$SIG$	=	.121E-02	.102E-02	.859E-03	.734E-03	.584E-03	.366E-03
$ABCDE$	=	.183E+02	.153E+03	-.379E+03	.224E+03	.000E+00	
$X$	=	3.34	4.93	7.58	12.04		
$STR$	=	.490E-02	.211E-02	.703E-03	.329E-03		
$SIG$	=	.155E-03	.453E-04	.981E-05	.289E-05		
$2p^2\ ^1D \rightarrow 2p3p\ ^3D$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
$X$	=	1.11	1.17	1.29	1.50	1.83	2.40
$STR$	=	.120E+00	.105E+00	.851E-01	.609E-01	.413E-01	.373E-01
$SIG$	=	.153E-01	.127E-01	.930E-02	.576E-02	.319E-02	.220E-02
$ABCDE$	=	.100E+04	-.398E+04	.552E+04	-.244E+04	.000E+00	
$X$	=	3.34	4.92	7.59	12.06		
$STR$	=	.430E-01	.401E-01	.240E-01	.120E-01		
$SIG$	=	.182E-02	.115E-02	.448E-03	.141E-03		
$2p^2\ ^1D \rightarrow 2p4p\ ^3D$ $E_0 = 27.71$ $E_1 = 4.32$ $E_{01} = 23.39$ (eV)							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.430E-01	.363E-01	.274E-01	.183E-01	.130E-01	.135E-01
$SIG$	=	.454E-02	.359E-02	.246E-02	.142E-02	.829E-03	.657E-03
$ABCDE$	=	.305E+03	-.923E+03	.894E+03	-.215E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.01		
$STR$	=	.151E-01	.121E-01	.587E-02	.283E-02		
$SIG$	=	.525E-03	.287E-03	.903E-04	.274E-04		

$2p^2\ ^1D \rightarrow 2p3p\ ^3S$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
X	=	1.11	1.17	1.29	1.50	1.83	2.40
STR	=	.307E-01	.272E-01	.220E-01	.155E-01	.103E-01	.982E-02
SIG	=	.392E-02	.328E-02	.241E-02	.147E-02	.800E-03	.579E-03
ABCDE	=	.296E+03	-.117E+04	.160E+04	-.696E+03	.000E+00	
X	=	3.34	4.92	7.59	12.06		
STR	=	.123E-01	.120E-01	.718E-02	.352E-02		
SIG	=	.521E-03	.344E-03	.134E-03	.413E-04		
$2p^2\ ^1D \rightarrow 2p4p\ ^3S$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
X	=	1.10	1.18	1.30	1.50	1.83	2.39
STR	=	.111E-01	.935E-02	.703E-02	.466E-02	.343E-02	.387E-02
SIG	=	.117E-02	.925E-03	.631E-03	.363E-01	.218E-03	.188E-01
ABCDE	=	.885E+02	-.252E+03	.211E+03	-.291E+02	.000E+00	
X	=	3.34	4.92	7.57	12.01		
STR	=	.452E-02	.367E-02	.176E-02	.820E-03		
SIG	=	.158E-03	.869E-04	.271E-04	.794E-05		
$2p^2\ ^1D \rightarrow 2p3p\ ^3P$ $E_0 = 27.71$ $E_1 = 8.46$ $E_{01} = 19.24$ (eV)							
X	=	1.11	1.17	1.29	1.50	1.83	2.40
STR	=	.690E-01	.612E-01	.495E-01	.350E-01	.233E-01	.221E-01
SIG	=	.882E-02	.737E-02	.541E-02	.330E-02	.180E-02	.130E-02
ABCDE	=	.666E+03	-.264E+04	.359E+04	-.157E+04	.000E+00	
X	=	3.34	4.92	7.59	12.06		
STR	=	.277E-01	.269E-01	.161E-01	.791E-02		
SIG	=	.117E-02	.773E-03	.301E-03	.928E-04		
$2p^2\ ^1D \rightarrow 2p4p\ ^3P$ $E_0 = 27.71$ $E_1 = 4.32$ $E_{01} = 23.39$ (eV)							
X	=	1.10	1.18	1.30	1.50	1.83	2.39
STR	=	.249E-01	.210E-01	.158E-01	.105E-01	.772E-02	.871E-02
SIG	=	.263E-02	.208E-02	.142E-02	.816E-03	.491E-03	.423E-03
ABCDE	=	.199E+03	-.567E+03	.474E+03	-.656E+02	.000E+00	
X	=	3.34	4.92	7.57	12.01		
STR	=	.102E-01	.826E-02	.397E-02	.184E-02		
SIG	=	.354E-03	.195E-03	.610E-04	.179E-04		
$2p^2\ ^1D \rightarrow 2p3d\ ^3F^0$ $E_0 = 27.71$ $E_1 = 6.46$ $E_{01} = 21.25$ (eV)							
X	=	1.11	1.18	1.29	1.50	1.83	2.39
STR	=	.240E+00	.240E+00	.237E+00	.227E+00	.200E+00	.151E+00
SIG	=	.278E-01	.261E-01	.234E-01	.194E-01	.140E-01	.808E-02
ABCDE	=	.165E+03	.269E+04	-.582E+04	.323E+04	.000E+00	
X	=	3.34	4.94	7.58	12.05		
STR	=	.912E-01	.423E-01	.143E-01	.514E-02		
SIG	=	.350E-02	.110E-02	.242E-03	.546E-04		
$2p^2\ ^1D \rightarrow 2p4d\ ^3F^0$ $E_0 = 27.71$ $E_1 = 3.59$ $E_{01} = 24.12$ (eV)							
X	=	1.10	1.18	1.29	1.50	1.83	2.39
STR	=	.982E-01	.974E-01	.956E-01	.919E-01	.806E-01	.596E-01
SIG	=	.100E-01	.933E-02	.834E-02	.693E-02	.497E-02	.281E-02
ABCDE	=	.543E+02	.132E+04	-.279E+04	.153E+04	.000E+00	
X	=	3.34	4.93	7.59	12.02		
STR	=	.349E-01	.153E-01	.475E-02	.177E-02		
SIG	=	.118E-02	.349E-03	.706E-04	.166E-04		
$2p^2\ ^1D \rightarrow 2p3d\ ^3D^0$ $E_0 = 27.71$ $E_1 = 6.36$ $E_{01} = 21.35$ (eV)							
X	=	1.11	1.18	1.29	1.49	1.83	2.39
STR	=	.106E+00	.102E+00	.978E-01	.923E-01	.824E-01	.634E-01
SIG	=	.122E-01	.111E-01	.964E-02	.787E-02	.574E-02	.338E-02
ABCDE	=	.196E+02	.145E+04	-.307E+04	.174E+04	.000E+00	

$X$	=	3.33	4.92	7.59	12.04		
$STR$	=	.384E-01	.171E-01	.539E-02	.174E-02		
$SIG$	=	.147E-02	.443E-03	.906E-04	.184E-04		
$2p^2^1D \rightarrow 2p4d^3D^0 \quad E_0 = 27.71 \quad E_1 = 3.53 \quad E_{01} = 24.18 \text{ (eV)}$							
$X$	=	1.10	1.17	1.29	1.49	1.83	2.40
$STR$	=	.410E-01	.393E-01	.378E-01	.361E-01	.325E-01	.246E-01
$SIG$	=	.418E-02	.377E-02	.329E-02	.272E-02	.200E-02	.116E-02
$ABCDE$	=	-.113E+01	.694E+03	-.145E+04	.810E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.04		
$STR$	=	.143E-01	.607E-02	.173E-02	.569E-03		
$SIG$	=	.483E-03	.139E-03	.258E-04	.533E-05		
$2p^2^1D \rightarrow 2p5d^3D^0 \quad E_0 = 27.71 \quad E_1 = 2.24 \quad E_{01} = 25.47 \text{ (eV)}$							
$X$	=	1.10	1.17	1.30	1.50	1.83	2.39
$STR$	=	.198E-01	.189E-01	.182E-01	.175E-01	.157E-01	.118E-01
$SIG$	=	.192E-02	.172E-02	.150E-02	.125E-02	.916E-03	.525E-03
$ABCDE$	=	-.258E+41	.356E+03	-.734E+03	.406E+03	.000E+00	
$X$	=	3.34	4.91	7.58	12.01		
$STR$	=	.669E-02	.273E-02	.758E-03	.251E-03		
$SIG$	=	.214E-03	.595E-04	.107E-04	.223E-05		
$2p^2^1D \rightarrow 2p3d^3P^0 \quad E_0 = 27.71 \quad E_1 = 6.18 \quad E_{01} = 21.53 \text{ (eV)}$							
$X$	=	1.11	1.18	1.30	1.50	1.83	2.39
$STR$	=	.588E-01	.557E-01	.522E-01	.482E-01	.420E-01	.311E-01
$SIG$	=	.673E-02	.599E-02	.509E-02	.408E-02	.290E-02	.165E-02
$ABCDE$	=	-.122E+02	.793E+03	-.159E+04	.876E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.03		
$STR$	=	.180E-01	.755E-02	.218E-02	.627E-03		
$SIG$	=	.682E-03	.194E-03	.364E-04	.659E-05		
$2p^2^1D \rightarrow 2p4d^3P^0 \quad E_0 = 27.71 \quad E_1 = 3.47 \quad E_{01} = 24.24 \text{ (eV)}$							
$X$	=	1.11	1.18	1.30	1.49	1.83	2.39
$STR$	=	.241E-01	.226E-01	.214E-01	.201E-01	.179E-01	.134E-01
$SIG$	=	.245E-02	.216E-02	.185E-02	.151E-02	.110E-02	.627E-03
$ABCDE$	=	-.873E+01	.408E+03	-.823E+03	.454E+03	.000E+00	
$X$	=	3.34	4.91	7.59	12.05		
$STR$	=	.754E-02	.302E-02	.812E-03	.242E-03		
$SIG$	=	.254E-03	.690E-04	.120E-04	.225E-05		
$2p^2^1D \rightarrow 2p5d^3P^0 \quad E_0 = 27.71 \quad E_1 = 2.24 \quad E_{01} = 25.47 \text{ (eV)}$							
$X$	=	1.10	1.17	1.30	1.50	1.83	2.39
$STR$	=	.127E-01	.119E-01	.113E-01	.109E-01	.100E-01	.772E-02
$SIG$	=	.123E-02	.108E-02	.930E-03	.778E-03	.585E-03	.344E-03
$ABCDE$	=	-.533E+01	.262E+03	-.546E+03	.307E+03	.000E+00	
$X$	=	3.34	4.91	7.58	12.01		
$STR$	=	.445E-02	.179E-02	.478E-03	.146E-03		
$SIG$	=	.142E-03	.391E-04	.673E-05	.129E-05		
$2p^2^1D \rightarrow 2p4f^3F \quad E_0 = 27.71 \quad E_1 = 3.42 \quad E_{01} = 24.28 \text{ (eV)}$							
$X$	=	1.10	1.17	1.29	1.49	1.83	2.39
$STR$	=	.864E-02	.840E-02	.777E-02	.647E-02	.452E-02	.241E-02
$SIG$	=	.877E-03	.802E-03	.673E-03	.485E-03	.277E-03	.113E-03
$ABCDE$	=	-.238E+01	.382E+02	-.252E+02	-.521E+01	.000E+00	
$X$	=	3.34	4.90	7.58	12.02		
$STR$	=	.941E-03	.263E-03	.518E-04	.123E-04		
$SIG$	=	.316E-04	.601E-05	.767E-06	.114E-06		

7.3 N III Direct Transitions

$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 ({}^1D) {}^2D$ $E_0 = 56.34$ $E_1 = 34.92$ $E_{01} = 21.42$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.852E+01	.879E+01	.927E+01	.102E+02	.119E+02	.145E+02
SIG	=	.819E+00	.776E+00	.701E+00	.604E+00	.488E+00	.368E+00
ABCDE	=	.362E+01	-.133E+01	.150E+02	-.938E+01	.733E+01	
X	=	7.28	13.54	26.01	50.89		
STR	=	.181E+02	.227E+02	.276E+02	.326E+02		
SIG	=	.262E+00	.177E+00	.113E+00	.678E-01		
$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 ({}^1S) {}^2S$ $E_0 = 56.34$ $E_1 = 31.91$ $E_{01} = 24.43$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.18
STR	=	.153E+01	.159E+01	.170E+01	.190E+01	.225E+01	.279E+01
SIG	=	.129E+00	.123E+00	.113E+00	.981E-01	.808E-01	.620E-01
ABCDE	=	.488E+00	.127E+00	.230E+01	-.150E+01	.151E+01	
X	=	7.29	13.55	26.03	50.76		
STR	=	.350E+01	.443E+01	.546E+01	.643E+01		
SIG	=	.446E-01	.303E-01	.195E-01	.118E-01		
$2s^2 2p^2 P^0 \rightarrow 2s 2p^2 ({}^3P) {}^2P$ $E_0 = 56.34$ $E_1 = 31.91$ $E_{01} = 24.43$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.18
STR	=	.106E+02	.114E+02	.129E+02	.154E+02	.193E+02	.247E+02
SIG	=	.892E+00	.881E+00	.855E+00	.797E+00	.694E+00	.549E+00
ABCDE	=	.450E+01	.374E+00	.145E+02	-.101E+02	.136E+02	
X	=	7.29	13.55	26.03	50.76		
STR	=	.314E+02	.398E+02	.492E+02	.579E+02		
SIG	=	.400E+00	.273E+00	.175E+00	.106E+00		
$2s^2 2p^2 P^0 \rightarrow 2s 3s^2 S$ $E_0 = 47.43$ $E_1 = 20.01$ $E_{01} = 27.42$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.16
STR	=	.224E+00	.233E+00	.252E+00	.286E+00	.354E+00	.479E+00
SIG	=	.168E-01	.161E-01	.149E-01	.132E-01	.113E-01	.953E-02
ABCDE	=	-.350E+00	.378E+00	.763E+00	-.601E+00	.495E+00	
X	=	7.29	13.56	25.99	50.68		
STR	=	.687E+00	.975E+00	.129E+01	.160E+01		
SIG	=	.780E-02	.595E-02	.410E-02	.262E-02		
$2s^2 2p^2 P^0 \rightarrow 2s 4s^2 S$ $E_0 = 47.44$ $E_1 = 10.13$ $E_{01} = 37.31$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.15
STR	=	.584E-01	.586E-01	.578E-01	.570E-01	.627E-01	.803E-01
SIG	=	.323E-02	.297E-02	.251E-02	.193E-02	.147E-02	.117E-02
ABCDE	=	-.142E-01	-.571E-01	.313E+00	-.187E+00	.652E-01	
X	=	7.29	13.56	26.02	50.92		
STR	=	.111E+00	.154E+00	.197E+00	.241E+00		
SIG	=	.925E-03	.689E-03	.461E-03	.288E-03		
$2s^2 2p^2 P^0 \rightarrow 2s 5s^2 S$ $E_0 = 47.44$ $E_1 = 6.07$ $E_{01} = 41.36$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.250E-01	.246E-01	.232E-01	.213E-01	.223E-01	.280E-01
SIG	=	.125E-02	.113E-02	.910E-03	.652E-03	.472E-03	.369E-03
ABCDE	=	-.169E-02	-.297E-01	.128E+00	-.720E-01	.212E-01	
X	=	7.30	13.54	26.11	50.77		
STR	=	.382E-01	.519E-01	.673E-01	.812E-01		
SIG	=	.287E-03	.210E-03	.141E-03	.877E-04		
$2s^2 2p^2 P^0 \rightarrow 2s 6s^2 S$ $E_0 = 47.44$ $E_1 = 4.08$ $E_{01} = 43.36$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.15
STR	=	.134E-01	.132E-01	.122E-01	.111E-01	.113E-01	.141E-01

<i>SIG</i>	=	.636E-03	.574E-03	.457E-03	.322E-03	.229E-03	.178E-03
<i>ABCDE</i>	=	.255E-03	-.167E-01	.662E-01	-.364E-01	.101E-01	
<i>X</i>	=	7.29	13.56	26.06	50.97		
<i>STR</i>	=	.191E-01	.256E-01	.330E-01	.399E-01		
<i>SIG</i>	=	.137E-03	.988E-04	.663E-04	.410E-04		
$2s^2 2p^2 P^0 \rightarrow 2s9s^2 S \quad E_0 = 47.43 \quad E_1 = 1.70 \quad E_{01} = 45.72 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.58	4.16
<i>STR</i>	=	.350E-02	.339E-02	.312E-02	.274E-02	.271E-02	.335E-02
<i>SIG</i>	=	.158E-03	.140E-03	.111E-03	.758E-04	.520E-04	.400E-04
<i>ABCDE</i>	=	.388E-03	-.500E-02	.176E-01	-.941E-02	.228E-02	
<i>X</i>	=	7.30	13.56	26.03	50.96		
<i>STR</i>	=	.453E-02	.601E-02	.769E-02	.930E-02		
<i>SIG</i>	=	.308E-04	.220E-04	.147E-04	.905E-05		
$2s^2 2p^2 P^0 \rightarrow 2s3p^2 P^0 \quad E_0 = 47.43 \quad E_1 = 16.92 \quad E_{01} = 30.50 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.58	4.16
<i>STR</i>	=	.121E+01	.122E+01	.123E+01	.126E+01	.131E+01	.135E+01
<i>SIG</i>	=	.817E-01	.753E-01	.653E-01	.522E-01	.376E-01	.242E-01
<i>ABCDE</i>	=	.151E+01	-.819E+00	.861E+00	-.357E+00	.000E+00	
<i>X</i>	=	7.31	13.54	26.03	50.81		
<i>STR</i>	=	.141E+01	.146E+01	.148E+01	.150E+01		
<i>SIG</i>	=	.143E-01	.802E-02	.422E-02	.219E-02		
$2s^2 2p^2 P^0 \rightarrow 2s4p^2 P^0 \quad E_0 = 47.43 \quad E_1 = 8.94 \quad E_{01} = 38.49 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.59	4.16
<i>STR</i>	=	.284E+00	.283E+00	.285E+00	.293E+00	.300E+00	.303E+00
<i>SIG</i>	=	.152E-01	.139E-01	.120E-01	.961E-02	.683E-02	.429E-02
<i>ABCDE</i>	=	.331E+00	-.133E+00	.142E+00	-.607E-01	.000E+00	
<i>X</i>	=	7.30	13.56	25.98	50.93		
<i>STR</i>	=	.316E+00	.323E+00	.325E+00	.328E+00		
<i>SIG</i>	=	.255E-02	.141E-02	.737E-03	.379E-03		
$2s^2 2p^2 P^0 \rightarrow 2s3d^2 D \quad E_0 = 47.43 \quad E_1 = 14.30 \quad E_{01} = 33.12 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.58	4.17
<i>STR</i>	=	.224E+01	.235E+01	.257E+01	.303E+01	.384E+01	.514E+01
<i>SIG</i>	=	.140E+00	.134E+00	.126E+00	.115E+00	.102E+00	.845E-01
<i>ABCDE</i>	=	-.727E+00	.452E+00	.610E+01	-.382E+01	.384E+01	
<i>X</i>	=	7.31	13.56	26.02	50.72		
<i>STR</i>	=	.699E+01	.939E+01	.118E+02	.144E+02		
<i>SIG</i>	=	.655E-01	.474E-01	.311E-01	.194E-01		
$2s^2 2p^2 P^0 \rightarrow 2s4d^2 D \quad E_0 = 47.43 \quad E_1 = 8.05 \quad E_{01} = 39.38 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.59	4.16
<i>STR</i>	=	.715E+00	.738E+00	.791E+00	.916E+00	.115E+01	.150E+01
<i>SIG</i>	=	.374E-01	.354E-01	.326E-01	.294E-01	.255E-01	.207E-01
<i>ABCDE</i>	=	.400E-01	.138E+00	.107E+01	-.570E+00	.964E+00	
<i>RAT</i>	=	1.01	1.00	.99	1.00	1.01	1.00
<i>X</i>	=	7.29	13.56	25.89	50.77		
<i>STR</i>	=	.197E+01	.257E+01	.320E+01	.383E+01		
<i>SIG</i>	=	.156E-01	.109E-01	.711E-02	.434E-02		
<i>RAT</i>	=	.99	1.00	1.01	1.00		
$2s^2 2p^2 P^0 \rightarrow 2s5d^2 D \quad E_0 = 47.43 \quad E_1 = 5.05 \quad E_{01} = 42.38 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.60	4.15
<i>STR</i>	=	.301E+00	.311E+00	.334E+00	.381E+00	.478E+00	.626E+00
<i>SIG</i>	=	.147E-01	.139E-01	.128E-01	.113E-01	.986E-02	.806E-02
<i>ABCDE</i>	=	.451E-01	-.156E-01	.530E+00	-.274E+00	.390E+00	

$X$	=	7.29	13.54	25.95	50.97		
$STR$	=	.818E+00	.106E+01	.132E+01	.159E+01		
$SIG$	=	.600E-02	.419E-02	.272E-02	.167E-02		
$2s^2 2p^2 P^0 \rightarrow 2s^2 6d^2 D \quad E_0 = 47.43 \quad E_1 = 3.49 \quad E_{01} = 43.94 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.161E+00	.165E+00	.178E+00	.202E+00	.254E+00	.331E+00
$SIG$	=	.758E-02	.712E-02	.657E-02	.581E-02	.505E-02	.410E-02
$ABCDE$	=	.385E-01	-.147E-01	.241E+00	-.109E+00	.199E+00	
$X$	=	7.30	13.54	25.94	50.74		
$STR$	=	.437E+00	.556E+00	.690E+00	.821E+00		
$SIG$	=	.309E-02	.212E-02	.137E-02	.835E-03		
$2s^2 2p^2 P^0 \rightarrow 2s^2 4f^2 F^0 \quad E_0 = 47.43 \quad E_1 = 7.73 \quad E_{01} = 39.70 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.739E-01	.692E-01	.640E-01	.614E-01	.670E-01	.848E-01
$SIG$	=	.383E-02	.330E-02	.262E-02	.195E-02	.147E-02	.117E-02
$ABCDE$	=	.134E+00	-.252E+00	.238E+00	-.346E-01	.000E+00	
$X$	=	7.30	13.55	25.94	50.88		
$STR$	=	.107E+00	.120E+00	.125E+00	.127E+00		
$SIG$	=	.834E-03	.506E-03	.275E-03	.143E-03		
$2s^2 2p^2 P^0 \rightarrow 2s^2 5f^2 F^0 \quad E_0 = 47.43 \quad E_1 = 4.95 \quad E_{01} = 42.48 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.17
$STR$	=	.480E-01	.449E-01	.410E-01	.388E-01	.419E-01	.526E-01
$SIG$	=	.233E-02	.200E-02	.156E-02	.115E-02	.865E-03	.674E-03
$ABCDE$	=	.820E-01	-.151E+00	.140E+00	-.157E-01	.000E+00	
$X$	=	7.30	13.56	26.12	50.83		
$STR$	=	.661E-01	.735E-01	.770E-01	.782E-01		
$SIG$	=	.483E-03	.289E-03	.157E-03	.821E-04		
$2s^2 2p^2 P^0 \rightarrow 2s^2 6f^2 F^0 \quad E_0 = 47.43 \quad E_1 = 3.43 \quad E_{01} = 44.00 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.304E-01	.284E-01	.257E-01	.242E-01	.260E-01	.324E-01
$SIG$	=	.143E-02	.122E-02	.949E-03	.694E-03	.517E-03	.402E-03
$ABCDE$	=	.500E-01	-.903E-01	.826E-01	-.703E-02	.000E+00	
$X$	=	7.30	13.55	25.91	50.91		
$STR$	=	.405E-01	.450E-01	.469E-01	.477E-01		
$SIG$	=	.286E-03	.171E-03	.932E-04	.483E-04		

#### 7.4 N IV Direct Transitions

$2s^2 1S \rightarrow 2s3s 1S \quad E_0 = 77.48 \quad E_1 = 29.82 \quad E_{01} = 47.65 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.15
$STR$	=	.207E+00	.216E+00	.230E+00	.251E+00	.276E+00	.300E+00
$SIG$	=	.537E-01	.514E-01	.470E-01	.400E-01	.305E-01	.206E-01
$ABCDE$	=	.337E+00	-.144E+00	-.510E-01	.577E-01	.000E+00	
$X$	=	7.30	13.56	26.02	50.78		
$STR$	=	.318E+00	.330E+00	.329E+00	.332E+00		
$SIG$	=	.124E-01	.696E-02	.361E-02	.187E-02		
$2s^2 1S \rightarrow 2s4s 1S \quad E_0 = 77.48 \quad E_1 = 15.85 \quad E_{01} = 61.63 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.15
$STR$	=	.391E-01	.414E-01	.451E-01	.503E-01	.559E-01	.610E-01
$SIG$	=	.785E-02	.762E-02	.711E-02	.617E-02	.479E-02	.324E-02
$ABCDE$	=	.682E-01	-.262E-01	-.179E-01	.128E-01	.000E+00	



$X$	=	7.30	13.55	25.96	50.79		
$STR$	=	.645E-01	.667E-01	.664E-01	.676E-01		
$SIG$	=	.195E-02	.109E-02	.565E-03	.294E-03		

$2s^2\ ^1S \rightarrow 2s5s\ ^1S$   $E_0 = 77.48$   $E_1 = 9.82$   $E_{01} = 67.66$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.145E-01	.155E-01	.171E-01	.191E-01	.215E-01	.234E-01
$SIG$	=	.266E-02	.260E-02	.246E-02	.214E-02	.167E-02	.113E-02
$ABCDE$	=	.263E-01	-.111E-01	-.455E-02	.280E-02	.000E+00	
$X$	=	7.30	13.55	26.01	50.84		
$STR$	=	.247E-01	.255E-01	.257E-01	.261E-01		
$SIG$	=	.681E-03	.378E-03	.198E-03	.103E-03		

$2s^2\ ^1S \rightarrow 2s6s\ ^1S$   $E_0 = 77.48$   $E_1 = 6.68$   $E_{01} = 70.79$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.58	4.15
$STR$	=	.710E-02	.763E-02	.844E-02	.950E-02	.107E-01	.117E-01
$SIG$	=	.124E-02	.122E-02	.116E-02	.102E-02	.794E-03	.540E-03
$ABCDE$	=	.132E-01	-.577E-02	-.220E-02	.132E-02	.000E+00	
$X$	=	7.30	13.55	25.99	50.85		
$STR$	=	.125E-01	.127E-01	.129E-01	.131E-01		
$SIG$	=	.328E-03	.181E-03	.953E-04	.494E-04		

$2s^2\ ^1S \rightarrow 2s7s\ ^1S$   $E_0 = 77.48$   $E_1 = 4.83$   $E_{01} = 72.65$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.406E-02	.436E-02	.486E-02	.545E-02	.616E-02	.677E-02
$SIG$	=	.692E-03	.680E-03	.648E-03	.570E-03	.446E-03	.305E-03
$ABCDE$	=	.761E-02	-.337E-02	-.120E-02	.692E-03	.000E+00	
$X$	=	7.30	13.55	26.02	50.79		
$STR$	=	.711E-02	.735E-02	.745E-02	.752E-02		
$SIG$	=	.182E-03	.102E-03	.536E-04	.277E-04		

$2s^2\ ^1S \rightarrow 2s8s\ ^1S$   $E_0 = 77.48$   $E_1 = 3.66$   $E_{01} = 73.82$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.255E-02	.274E-02	.304E-02	.344E-02	.390E-02	.428E-02
$SIG$	=	.427E-03	.420E-03	.402E-03	.354E-03	.278E-03	.190E-03
$ABCDE$	=	.481E-02	-.175E-02	-.188E-02	.119E-02	.000E+00	
$X$	=	7.30	13.55	26.01	50.80		
$STR$	=	.459E-02	.465E-02	.471E-02	.476E-02		
$SIG$	=	.116E-03	.632E-04	.334E-04	.173E-04		

$2s^2\ ^1S \rightarrow 2s2p\ ^1P$   $E_0 = 77.48$   $E_1 = 61.28$   $E_{01} = 16.20$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.546E+01	.557E+01	.577E+01	.635E+01	.688E+01	.796E+01
$SIG$	=	.418E+01	.391E+01	.346E+01	.297E+01	.224E+01	.161E+01
$ABCDE$	=	.144E+01	.335E+01	.465E+01	-.438E+01	.384E+01	
$X$	=	7.28	13.58	26.04	50.85		
$STR$	=	.939E+01	.117E+02	.142E+02	.168E+02		
$SIG$	=	.108E+01	.723E+00	.458E+00	.277E+00		

$2s^2\ ^1S \rightarrow 2s3p\ ^1P^0$   $E_0 = 77.48$   $E_1 = 27.32$   $E_{01} = 50.16$  (eV)

$X$	=	1.10	1.20	1.40	1.79	2.59	4.17
$STR$	=	.417E-01	.509E-01	.716E-01	.117E+00	.200E+00	.322E+00
$SIG$	=	.103E-01	.115E-01	.139E-01	.177E-01	.209E-01	.210E-01
$ABCDE$	=	-.440E+00	.513E+00	.133E+00	-.187E+00	.445E+00	
$X$	=	7.30	13.56	25.92	50.84		
$STR$	=	.505E+00	.762E+00	.104E+01	.132E+01		
$SIG$	=	.188E-01	.152E-01	.109E-01	.706E-02		

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$2s^2 1S \rightarrow 2s4p 1P^0$ $E_0 = 77.48$ $E_1 = 14.61$ $E_{01} = 62.87$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.17
STR	=	.709E-02	.923E-02	.144E-01	.256E-01	.446E-01	.726E-01
SIG	=	.139E-02	.167E-02	.223E-02	.309E-02	.374E-02	.379E-02
ABCDE	=	-.696E-01	.492E-01	.818E-01	-.598E-01	.893E-01	
X	=	7.30	13.56	25.92	50.84		
STR	=	.114E+00	.168E+00	.225E+00	.283E+00		
SIG	=	.337E-02	.268E-02	.187E-02	.120E-02		
$2s^2 1S \rightarrow 2s6p 1P^0$ $E_0 = 77.48$ $E_1 = 6.47$ $E_{01} = 71.01$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.15
STR	=	.325E-02	.414E-02	.595E-02	.967E-02	.160E-01	.243E-01
SIG	=	.567E-03	.661E-03	.815E-03	.104E-02	.119E-02	.112E-02
ABCDE	=	.122E-01	.118E-01	.882E-02	-.659E-02	.234E-01	
X	=	7.29	13.55	26.05	50.84		
STR	=	.355E-01	.497E-01	.650E-01	.800E-01		
SIG	=	.931E-03	.703E-03	.478E-03	.302E-03		
$2s^2 1S \rightarrow 2s7p 1P^0$ $E_0 = 77.48$ $E_1 = 4.57$ $E_{01} = 72.91$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.58	4.16
STR	=	.538E-03	.764E-03	.131E-02	.254E-02	.477E-02	.791E-02
SIG	=	.913E-04	.119E-03	.175E-03	.264E-03	.345E-03	.355E-03
ABCDE	=	-.652E-02	.332E-02	.848E-02	-.522E-02	.933E-02	
X	=	7.30	13.55	26.06	50.89		
STR	=	.124E-01	.181E-01	.242E-01	.302E-01		
SIG	=	.317E-03	.249E-03	.173E-03	.111E-03		
$2s^2 1S \rightarrow 2s8p 1P^0$ $E_0 = 77.48$ $E_1 = 3.55$ $E_{01} = 73.93$ (eV)							
X	=	1.10	1.20	1.39	1.80	2.58	4.15
STR	=	.906E-03	.118E-02	.178E-02	.301E-02	.512E-02	.797E-02
SIG	=	.152E-03	.181E-03	.235E-03	.308E-03	.365E-03	.353E-03
ABCDE	=	-.417E-02	.272E-02	.490E-02	-.298E-02	.795E-02	
X	=	7.29	13.53	25.97	50.86		
STR	=	.120E-01	.167E-01	.219E-01	.272E-01		
SIG	=	.302E-03	.227E-03	.155E-03	.984E-04		
$2s^2 1S \rightarrow 2s9p 1P^0$ $E_0 = 77.48$ $E_1 = 2.76$ $E_{01} = 74.71$ (eV)							
X	=	1.10	1.20	1.41	1.79	2.58	4.16
STR	=	.335E-03	.463E-03	.765E-03	.140E-02	.255E-02	.412E-02
SIG	=	.554E-04	.703E-04	.992E-04	.142E-03	.180E-03	.180E-03
ABCDE	=	-.291E-02	.148E-02	.395E-02	-.244E-02	.457E-02	
X	=	7.29	13.52	25.97	50.86		
STR	=	.630E-02	.911E-02	.121E-01	.151E-01		
SIG	=	.157E-03	.123E-03	.852E-04	.540E-04		
$2s^2 1S \rightarrow 2s3d 1D$ $E_0 = 77.48$ $E_1 = 24.27$ $E_{01} = 53.20$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.15
STR	=	.188E+00	.210E+00	.249E+00	.308E+00	.380E+00	.476E+00
SIG	=	.438E-01	.447E-01	.454E-01	.439E-01	.375E-01	.293E-01
ABCDE	=	.749E+00	-.134E+01	.124E+01	-.482E+00	.000E+00	
X	=	7.29	13.55	25.94	50.94		
STR	=	.596E+00	.679E+00	.704E+00	.716E+00		
SIG	=	.209E-01	.128E-01	.695E-02	.359E-02		
$2s^2 1S \rightarrow 2s4d 1D$ $E_0 = 77.48$ $E_1 = 13.67$ $E_{01} = 63.81$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.15
STR	=	.464E-01	.520E-01	.627E-01	.794E-01	.990E-01	.122E+00
SIG	=	.900E-02	.924E-02	.957E-02	.939E-02	.816E-02	.625E-02
ABCDE	=	.183E+00	-.287E+00	.214E+00	-.700E-01	.000E+00	

$X$	=	7.30	13.56	26.02	50.94		
$STR$	=	.150E+00	.169E+00	.174E+00	.176E+00		
$SIG$	=	.439E-02	.266E-02	.143E-02	.738E-03		
$2s^2 1S \rightarrow 2s5d^1D \ E_0 = 77.48 \ E_1 = 8.75 \ E_{01} = 68.73 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.187E-01	.211E-01	.256E-01	.325E-01	.410E-01	.502E-01
$SIG$	=	.337E-02	.347E-02	.362E-02	.359E-02	.313E-02	.239E-02
$ABCDE$	=	.739E-01	-.110E+00	.758E-01	-.238E-01	.000E+00	
$X$	=	7.29	13.55	26.05	50.93		
$STR$	=	.609E-01	.679E-01	.707E-01	.711E-01		
$SIG$	=	.165E-02	.993E-03	.538E-03	.277E-03		
$2s^2 1S \rightarrow 2s6d^1D \ E_0 = 77.48 \ E_1 = 6.07 \ E_{01} = 71.40 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.950E-02	.107E-01	.131E-01	.167E-01	.211E-01	.258E-01
$SIG$	=	.165E-02	.170E-02	.178E-02	.178E-02	.155E-02	.118E-02
$ABCDE$	=	.377E-01	-.546E-01	.352E-01	-.102E-01	.000E+00	
$X$	=	7.30	13.56	26.05	50.84		
$STR$	=	.312E-01	.349E-01	.362E-01	.363E-01		
$SIG$	=	.815E-03	.490E-03	.265E-03	.136E-03		
$2s^2 1S \rightarrow 2s7d^1D \ E_0 = 77.48 \ E_1 = 4.46 \ E_{01} = 73.02 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.553E-02	.625E-02	.762E-02	.981E-02	.124E-01	.151E-01
$SIG$	=	.938E-03	.971E-03	.102E-02	.102E-02	.890E-03	.677E-03
$ABCDE$	=	.221E-01	-.309E-01	.179E-01	-.423E-02	.000E+00	
$X$	=	7.30	13.55	26.02	50.81		
$STR$	=	.185E-01	.204E-01	.212E-01	.212E-01		
$SIG$	=	.472E-03	.281E-03	.152E-03	.778E-04		
$2s^2 1S \rightarrow 2s8d^1D \ E_0 = 77.48 \ E_1 = 3.42 \ E_{01} = 74.06 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.353E-02	.400E-02	.490E-02	.629E-02	.791E-02	.970E-02
$SIG$	=	.589E-03	.613E-03	.640E-03	.643E-03	.563E-03	.429E-03
$ABCDE$	=	.141E-01	-.197E-01	.112E-01	-.255E-02	.000E+00	
$X$	=	7.29	13.50	26.06	50.90		
$STR$	=	.119E-01	.130E-01	.135E-01	.136E-01		
$SIG$	=	.299E-03	.177E-03	.953E-04	.491E-04		
$2s^2 1S \rightarrow 2s9d^1D \ E_0 = 77.48 \ E_1 = 2.70 \ E_{01} = 74.78 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.239E-02	.270E-02	.331E-02	.427E-02	.539E-02	.659E-02
$SIG$	=	.395E-03	.410E-03	.429E-03	.433E-03	.380E-03	.288E-03
$ABCDE$	=	.954E-02	-.132E-01	.735E-02	-.167E-02	.000E+00	
$X$	=	7.30	13.51	26.08	50.82		
$STR$	=	.799E-02	.882E-02	.917E-02	.919E-02		
$SIG$	=	.199E-03	.119E-03	.640E-04	.329E-04		
$2s^2 1S \rightarrow 2s4f^1F^0 \ E_0 = 77.48 \ E_1 = 13.61 \ E_{01} = 63.87 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.791E-02	.866E-02	.102E-01	.122E-01	.160E-01	.215E-01
$SIG$	=	.153E-02	.154E-02	.155E-02	.145E-02	.132E-02	.110E-02
$ABCDE$	=	.250E-01	-.687E-02	-.519E-01	.433E-01	.000E+00	
$X$	=	7.30	13.54	25.99	50.88		
$STR$	=	.241E-01	.244E-01	.245E-01	.246E-01		
$SIG$	=	.703E-03	.384E-03	.201E-03	.103E-03		

$2s^2 1S \rightarrow 2s5f^1F^0$ $E_0 = 77.48$ $E_1 = 8.71$ $E_{01} = 68.77$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.456E-02	.501E-02	.595E-02	.726E-02	.949E-02	.127E-01
$SIG$	=	.821E-03	.827E-03	.841E-03	.803E-03	.725E-03	.603E-03
$ABCDE$	=	.148E-01	-.444E-02	-.294E-01	.244E-01	.000E+00	
$X$	=	7.30	13.54	25.99	50.88		
$STR$	=	.143E-01	.144E-01	.145E-01	.146E-01		
$SIG$	=	.387E-03	.210E-03	.110E-03	.569E-04		
$2s^2 1S \rightarrow 2s6f^1F^0$ $E_0 = 77.48$ $E_1 = 6.05$ $E_{01} = 71.43$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.281E-02	.309E-02	.367E-02	.452E-02	.588E-02	.784E-02
$SIG$	=	.486E-03	.491E-03	.500E-03	.481E-03	.433E-03	.359E-03
$ABCDE$	=	.921E-02	-.292E-02	-.178E-01	.148E-01	.000E+00	
$X$	=	7.29	13.55	26.04	50.82		
$STR$	=	.881E-02	.895E-02	.901E-02	.905E-02		
$SIG$	=	.230E-03	.126E-03	.659E-04	.339E-04		
$2s2p^3P^0 \rightarrow 2s3s^3S$ $E_0 = 69.14$ $E_1 = 30.70$ $E_{01} = 38.45$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.190E+00	.190E+00	.196E+00	.224E+00	.291E+00	.409E+00
$SIG$	=	.680E-02	.623E-02	.551E-02	.490E-02	.443E-02	.387E-02
$ABCDE$	=	-.412E+00	.521E+00	.391E+00	-.324E+00	.476E+00	
$X$	=	7.29	13.56	26.03	50.75		
$STR$	=	.595E+00	.868E+00	.117E+01	.147E+01		
$SIG$	=	.321E-02	.252E-02	.177E-02	.114E-02		
$2s2p^3P^0 \rightarrow 2s4s^3S$ $E_0 = 69.14$ $E_1 = 16.37$ $E_{01} = 52.77$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.15
$STR$	=	.563E-01	.531E-01	.493E-01	.493E-01	.582E-01	.777E-01
$SIG$	=	.147E-02	.127E-02	.101E-02	.787E-03	.647E-03	.536E-03
$ABCDE$	=	-.279E-01	-.277E-02	.168E+00	-.790E-01	.685E-01	
$X$	=	7.30	13.55	25.96	50.79		
$STR$	=	.108E+00	.151E+0	.197E+00	.242E+00		
$SIG$	=	.424E-03	.320E-03	.218E-03	.137E-03		
$2s2p^3P^0 \rightarrow 2s5s^3S$ $E_0 = 69.14$ $E_1 = 9.93$ $E_{01} = 59.21$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.15
$STR$	=	.228E-01	.208E-01	.184E-01	.169E-01	.189E-01	.246E-01
$SIG$	=	.530E-03	.444E-03	.336E-03	.241E-03	.187E-03	.151E-03
$ABCDE$	=	-.462E-02	-.168E-01	.797E-01	-.337E-01	.204E-01	
$X$	=	7.30	13.54	26.01	50.83		
$STR$	=	.341E-01	.481E-01	.620E-01	.757E-01		
$SIG$	=	.119E-03	.906E-04	.608E-04	.380E-04		
$2s2p^3P^0 \rightarrow 2s6s^3S$ $E_0 = 69.14$ $E_1 = 6.75$ $E_{01} = 62.39$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.15
$STR$	=	.125E-01	.114E-01	.979E-02	.886E-02	.967E-02	.124E-01
$SIG$	=	.276E-03	.230E-03	.170E-03	.120E-03	.908E-04	.725E-04
$ABCDE$	=	-.149E-02	-.946E-02	.402E-01	-.154E-01	.991E-02	
$X$	=	7.30	13.55	25.97	50.83		
$STR$	=	.171E-01	.240E-01	.307E-01	.374E-01		
$SIG$	=	.569E-04	.429E-04	.287E-04	.178E-04		
$2s2p^3P^0 \rightarrow 2s7s^3S$ $E_0 = 69.14$ $E_1 = 4.92$ $E_{01} = 64.22$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.790E-02	.712E-02	.616E-02	.553E-02	.603E-02	.773E-02
$SIG$	=	.169E-03	.140E-03	.104E-03	.727E-04	.549E-04	.438E-04
$ABCDE$	=	-.413E-03	-.549E-02	.224E-01	-.774E-02	.580E-02	

$X$	=	7.30	13.55	26.00	50.92		
$STR$	=	.105E-01	.145E-01	.184E-01	.224E-01		
$SIG$	=	.337E-04	.252E-04	.167E-04	.103E-04		
$2s2p^3P^0 \rightarrow 2s8s^3S \ E_0 = 69.14 \ E_1 = 3.53 \ E_{01} = 65.61 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.477E-02	.436E-02	.378E-02	.315E-02	.269E-02	.259E-02
$SIG$	=	.998E-04	.838E-04	.624E-04	.403E-04	.239E-04	.144E-04
$ABCDE$	=	.245E-02	-.702E-02	.182E-01	-.863E-02	.682E-03	
$X$	=	7.30	13.55	26.07	50.92		
$STR$	=	.309E-02	.388E-02	.444E-02	.501E-02		
$SIG$	=	.976E-05	.661E-05	.392E-05	.227E-05		
$2s2p^3P^0 \rightarrow 2s9s^3S \ E_0 = 69.14 \ E_1 = 2.87 \ E_{01} = 66.27 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.17
$STR$	=	.330E-02	.293E-02	.246E-02	.214E-02	.227E-02	.289E-02
$SIG$	=	.684E-04	.557E-04	.402E-04	.272E-04	.201E-04	.158E-04
$ABCDE$	=	-.111E-03	-.260E-02	.949E-02	-.306E-02	.219E-02	
$X$	=	7.29	13.56	25.96	50.87		
$STR$	=	.393E-02	.550E-02	.698E-02	.848E-02		
$SIG$	=	.123E-04	.925E-05	.614E-05	.380E-05		
$2s2p^3P^0 \rightarrow 2s3p^3P^0 \ E_0 = 69.14 \ E_1 = 27.47 \ E_{01} = 41.67 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.15
$STR$	=	.162E+01	.164E+01	.166E+01	.170E+01	.174E+01	.179E+01
$SIG$	=	.534E-01	.495E-01	.432E-01	.344E-01	.243E-01	.156E-01
$ABCDE$	=	.200E+01	-.118E+01	.160E+01	-.848E+00	.000E+00	
$X$	=	7.30	13.56	25.92	50.88		
$STR$	=	.188E+01	.192E+01	.195E+01	.199E+01		
$SIG$	=	.935E-02	.513E-02	.273E-02	.142E-02		
$2s2p^3P^0 \rightarrow 2s4p^3P^0 \ E_0 = 69.14 \ E_1 = 14.91 \ E_{01} = 54.23 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.17
$STR$	=	.364E+00	.367E+00	.370E+00	.372E+00	.372E+00	.377E+00
$SIG$	=	.923E-02	.853E-02	.738E-02	.578E-02	.402E-02	.252E-02
$ABCDE$	=	.416E+00	-.224E+00	.367E+00	-.202E+00	.000E+00	
$X$	=	7.30	13.55	26.00	50.90		
$STR$	=	.394E+00	.407E+00	.407E+00	.411E+00		
$SIG$	=	.151E-02	.837E-03	.437E-03	.225E-03		
$2s2p^3P^0 \rightarrow 2s3d^3D \ E_0 = 69.14 \ E_1 = 25.41 \ E_{01} = 43.74 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.393E+01	.414E+01	.458E+01	.539E+01	.675E+01	.875E+01
$SIG$	=	.124E+00	.119E+00	.113E+00	.104E+00	.903E-01	.727E-01
$ABCDE$	=	-.152E+01	.383E+01	.596E+01	-.481E+01	.638E+01	
$X$	=	7.29	13.56	26.07	50.76		
$STR$	=	.116E+02	.155E+02	.196E+02	.236E+02		
$SIG$	=	.549E-01	.394E-01	.259E-01	.161E-01		
$2s2p^3P^0 \rightarrow 2s4d^3D \ E_0 = 69.14 \ E_1 = 14.06 \ E_{01} = 55.08 \ (eV)$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.946E+00	.983E+00	.106E+01	.122E+01	.151E+01	.194E+01
$SIG$	=	.236E-01	.225E-01	.209E-01	.187E-01	.161E-01	.128E-01
$ABCDE$	=	.123E+00	.374E+00	.985E+00	-.599E+00	.118E+01	
$X$	=	7.30	13.55	25.97	50.86		
$STR$	=	.250E+01	.324E+01	.398E+01	.477E+01		
$SIG$	=	.941E-02	.656E-02	.421E-02	.258E-02		

$2s2p^3P^0 \rightarrow 2s5d^3D$ $E_0 = 69.14$ $E_1 = 8.95$ $E_{01} = 60.19$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.15
STR	=	.389E+00	.404E+00	.434E+00	.496E+00	.608E+00	.769E+00
SIG	=	.888E-02	.845E-02	.779E-02	.694E-02	.589E-02	.465E-02
ABCDE	=	.183E+00	-.196E+00	.815E+00	-.442E+00	.417E+00	
X	=	7.29	13.56	26.08	50.84		
STR	=	.989E+00	.126E+01	.154E+01	.182E+01		
SIG	=	.341E-02	.234E-02	.148E-02	.901E-03		
$2s2p^3P^0 \rightarrow 2s6d^3D$ $E_0 = 69.14$ $E_1 = 6.18$ $E_{01} = 62.96$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.201E+00	.207E+00	.222E+00	.254E+00	.310E+00	.390E+00
SIG	=	.440E-02	.415E-02	.381E-02	.340E-02	.287E-02	.225E-02
ABCDE	=	.981E-01	-.716E-01	.336E+00	-.174E+00	.206E+00	
X	=	7.29	13.55	26.05	50.83		
STR	=	.499E+00	.631E+00	.769E+00	.910E+00		
SIG	=	.164E-02	.112E-02	.709E-03	.430E-03		
$2s2p^3P^0 \rightarrow 2s7d^3D$ $E_0 = 69.14$ $E_1 = 4.53$ $E_{01} = 64.61$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.58	4.16
STR	=	.119E+00	.122E+00	.131E+00	.149E+00	.182E+00	.229E+00
SIG	=	.253E-02	.238E-02	.219E-02	.194E-02	.165E-02	.128E-02
ABCDE	=	.594E-01	-.292E-01	.158E+00	-.749E-01	.119E+00	
X	=	7.29	13.54	26.00	50.92		
STR	=	.293E+00	.368E+00	.446E+00	.527E+00		
SIG	=	.939E-03	.636E-03	.402E-03	.242E-03		
$2s2p^3P^0 \rightarrow 2s8d^3D$ $E_0 = 69.14$ $E_1 = 3.46$ $E_{01} = 65.68$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.16
STR	=	.765E-01	.785E-01	.837E-01	.954E-01	.117E+00	.147E+00
SIG	=	.160E-02	.151E-02	.138E-02	.122E-02	.104E-02	.812E-03
ABCDE	=	.461E-01	-.477E-01	.142E+00	-.678E-01	.739E-01	
X	=	7.29	13.55	26.04	50.85		
STR	=	.187E+00	.237E+00	.286E+00	.336E+00		
SIG	=	.590E-03	.402E-03	.253E-03	.152E-03		
$2s2p^3P^0 \rightarrow 2s9d^3D$ $E_0 = 69.14$ $E_1 = 2.72$ $E_{01} = 66.42$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.59	4.16
STR	=	.520E-01	.535E-01	.566E-01	.642E-01	.784E-01	.980E-01
SIG	=	.108E-02	.101E-02	.921E-03	.816E-03	.689E-03	.537E-03
ABCDE	=	.325E-01	-.321E-01	.915E-01	-.423E-01	.485E-01	
X	=	7.29	13.55	26.06	50.91		
STR	=	.125E+00	.158E+00	.190E+00	.223E+00		
SIG	=	.391E-03	.265E-03	.166E-03	.999E-04		
$2s2p^3P^0 \rightarrow 2s4f^3F^0$ $E_0 = 69.14$ $E_1 = 13.61$ $E_{01} = 55.53$ (eV)							
X	=	1.10	1.20	1.40	1.80	2.59	4.16
STR	=	.108E+00	.105E+00	.104E+00	.110E+00	.128E+00	.167E+00
SIG	=	.267E-02	.238E-02	.203E-02	.167E-02	.134E-02	.109E-02
ABCDE	=	.271E+00	-.524E+00	.473E+00	-.101E+00	.000E+00	
X	=	7.29	13.54	25.93	50.78		
STR	=	.215E+00	.243E+00	.253E+00	.258E+00		
SIG	=	.801E-03	.488E-03	.266E-03	.138E-03		
$2s2p^3P^0 \rightarrow 2s5f^3F^0$ $E_0 = 69.14$ $E_1 = 8.71$ $E_{01} = 60.43$ (eV)							
X	=	1.10	1.20	1.40	1.79	2.58	4.15
STR	=	.673E-01	.649E-01	.633E-01	.657E-01	.760E-01	.986E-01
SIG	=	.153E-02	.135E-02	.113E-02	.920E-03	.737E-03	.594E-03
ABCDE	=	.157E+00	-.291E+00	.248E+00	-.384E-01	.000E+00	

$X$	=	7.30	13.56	25.99	50.82		
$STR$	=	.125E+00	.141E+00	.147E+00	.149E+00		
$SIG$	=	.429E-03	.261E-03	.142E-03	.736E-04		

7.5 *N IV Exchange Transitions*

$$2s^2 1S \rightarrow 2s3s^3S \quad E_0 = 77.48 \quad E_1 = 29.82 \quad E_{01} = 47.65 \text{ (eV)}$$

$X$	=	1.10	1.18	1.29	1.49	1.83	2.39
$STR$	=	.367E-01	.330E-01	.284E-01	.231E-01	.172E-01	.118E-01
$SIG$	=	.949E-02	.803E-02	.627E-02	.441E-02	.268E-02	.141E-02
$ABCDE$	=	.262E+03	.151E+03	-.625E+03	.494E+03	.000E+00	
$X$	=	3.34	4.91	7.58	12.02		
$STR$	=	.733E-02	.401E-02	.188E-02	.706E-03		
$SIG$	=	.627E-03	.233E-03	.709E-04	.168E-04		

$$2s^2 1S \rightarrow 2s4s^3S \quad E_0 = 77.48 \quad E_1 = 15.85 \quad E_{01} = 61.63 \text{ (eV)}$$

$X$	=	1.10	1.18	1.29	1.49	1.83	2.39
$STR$	=	.118E-01	.105E-01	.876E-02	.682E-02	.491E-02	.324E-02
$SIG$	=	.236E-02	.196E-02	.149E-02	.101E-02	.592E-03	.300E-03
$ABCDE$	=	.669E+02	.247E+03	-.620E+03	.409E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.04		
$STR$	=	.193E-02	.989E-03	.416E-03	.131E-03		
$SIG$	=	.128E-03	.444E-04	.121E-04	.241E-05		

$$2s^2 1S \rightarrow 2s5s^3S \quad E_0 = 77.48 \quad E_1 = 9.82 \quad E_{01} = 67.66 \text{ (eV)}$$

$X$	=	1.10	1.17	1.29	1.49	1.83	2.39
$STR$	=	.534E-02	.469E-02	.389E-02	.299E-02	.214E-02	.140E-02
$SIG$	=	.973E-03	.803E-03	.604E-03	.403E-03	.235E-03	.117E-03
$ABCDE$	=	.256E+02	.158E+03	-.373E+03	.238E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.03		
$STR$	=	.811E-03	.403E-03	.162E-03	.473E-04		
$SIG$	=	.488E-04	.165E-04	.430E-05	.791E-06		

$$2s^2 1S \rightarrow 2s6s^3S \quad E_0 = 77.48 \quad E_1 = 6.68 \quad E_{01} = 70.79 \text{ (eV)}$$

$X$	=	1.10	1.17	1.29	1.49	1.83	2.39
$STR$	=	.290E-02	.253E-02	.208E-02	.160E-02	.113E-02	.728E-03
$SIG$	=	.505E-03	.414E-03	.309E-03	.205E-03	.118E-03	.586E-04
$ABCDE$	=	.131E+02	.929E+02	-.216E+03	.137E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.03		
$STR$	=	.420E-03	.207E-03	.817E-04	.230E-04		
$SIG$	=	.242E-04	.809E-05	.207E-05	.367E-06		

$$454 \ 2s^2 1S \rightarrow 2s7s^3S \quad E_0 = 77.48 \quad E_1 = 4.83 \quad E_{01} = 72.65 \text{ (eV)}$$

$X$	=	1.10	1.18	1.30	1.50	1.83	2.40
$STR$	=	.174E-02	.152E-02	.125E-02	.958E-03	.676E-03	.434E-03
$SIG$	=	.295E-03	.243E-03	.180E-03	.120E-03	.691E-04	.339E-04
$ABCDE$	=	.743E+01	.601E+02	-.138E+03	.862E+02	.000E+00	
$X$	=	3.33	4.91	7.57	12.03		
$STR$	=	.247E-03	.121E-03	.474E-04	.129E-04		
$SIG$	=	.139E-04	.462E-05	.117E-05	.202E-06		

$$2s^2 1S \rightarrow 2s8s^3S \quad E_0 = 77.48 \quad E_1 = 3.66 \quad E_{01} = 73.82 \text{ (eV)}$$

$X$	=	1.10	1.18	1.30	1.49	1.83	2.40
$STR$	=	.113E-02	.987E-03	.811E-03	.616E-03	.434E-03	.281E-03
$SIG$	=	.189E-03	.155E-03	.115E-03	.762E-04	.437E-04	.216E-04
$ABCDE$	=	.442E+01	.430E+02	-.980E+02	.614E+02	.000E+00	

EXCITATION OF NITROGEN IONS

$X = 3.33 \quad 4.92 \quad 7.57 \quad 12.03$   
 $STR = .159E-03 \quad .772E-04 \quad .301E-04 \quad .792E-05$   
 $SIG = .879E-05 \quad .289E-05 \quad .732E-06 \quad .121E-06$

$2s^2 1S \rightarrow 2s9s^3S \quad E_0 = 77.48 \quad E_1 = 2.87 \quad E_{01} = 74.60 \text{ (eV)}$

$X = 1.10 \quad 1.18 \quad 1.29 \quad 1.50 \quad 1.84 \quad 2.40$   
 $STR = .781E-03 \quad .676E-03 \quad .553E-03 \quad .424E-03 \quad .299E-03 \quad .190E-03$   
 $SIG = .129E-03 \quad .105E-03 \quad .779E-04 \quad .516E-04 \quad .296E-04 \quad .145E-04$   
 $ABCDE = .311E+01 \quad .291E+02 \quad -.661E+02 \quad .413E+02 \quad .000E+00$   
 $X = 3.34 \quad 4.92 \quad 7.57 \quad 12.04$   
 $STR = .108E-03 \quad .526E-04 \quad .202E-04 \quad .545E-05$   
 $SIG = .592E-05 \quad .195E-05 \quad .486E-06 \quad .826E-07$

$2s^2 1S \rightarrow 2s2p^3P^0 \quad E_0 = 77.48 \quad E_1 = 69.14 \quad E_{01} = 8.34 \text{ (eV)}$

$X = 1.10 \quad 1.18 \quad 1.29 \quad 1.50 \quad 1.83 \quad 2.39$   
 $STR = .484E+00 \quad .478E+00 \quad .464E+00 \quad .446E+00 \quad .414E+00 \quad .369E+00$   
 $SIG = .715E+00 \quad .662E+00 \quad .585E+00 \quad .485E+00 \quad .369E+00 \quad .251E+00$   
 $ABCDE = .346E+04 \quad -.351E+04 \quad .679E+04 \quad -.391E+04 \quad .000E+00$   
 $X = 3.34 \quad 4.92 \quad 7.58 \quad 11.97$   
 $STR = .311E+00 \quad .242E+00 \quad .174E+00 \quad .115E+00$   
 $SIG = .152E+00 \quad .803E-01 \quad .374E-01 \quad .156E-01$

$2s^2 1S \rightarrow 2s3p^3P \quad E_0 = 77.48 \quad E_1 = 27.15 \quad E_{01} = 50.33 \text{ (eV)}$

$X = 1.10 \quad 1.18 \quad 1.29 \quad 1.50 \quad 1.83 \quad 2.38$   
 $STR = .226E-01 \quad .213E-01 \quad .192E-01 \quad .167E-01 \quad .136E-01 \quad .101E-01$   
 $SIG = .554E-02 \quad .489E-02 \quad .401E-02 \quad .302E-02 \quad .200E-02 \quad .114E-02$   
 $ABCDE = .160E+03 \quad .783E+03 \quad -.197E+04 \quad .122E+04 \quad .000E+00$   
 $X = 3.34 \quad 4.93 \quad 7.57 \quad 12.04$   
 $STR = .651E-02 \quad .351E-02 \quad .148E-02 \quad .481E-03$   
 $SIG = .527E-03 \quad .192E-03 \quad .530E-04 \quad .108E-04$

$2s^2 1S \rightarrow 2s4p^3P \quad E_0 = 77.48 \quad E_1 = 15.02 \quad E_{01} = 62.46 \text{ (eV)}$

$X = 1.10 \quad 1.18 \quad 1.30 \quad 1.50 \quad 1.83 \quad 2.39$   
 $STR = .885E-02 \quad .823E-02 \quad .735E-02 \quad .621E-02 \quad .484E-02 \quad .340E-02$   
 $SIG = .175E-02 \quad .153E-02 \quad .124E-02 \quad .905E-03 \quad .577E-03 \quad .311E-03$   
 $ABCDE = .325E+02 \quad .509E+03 \quad -.112E+04 \quad .659E+03 \quad .000E+00$   
 $X = 3.33 \quad 4.92 \quad 7.57 \quad 12.04$   
 $STR = .204E-02 \quad .992E-03 \quad .375E-03 \quad .993E-04$   
 $SIG = .133E-03 \quad .439E-04 \quad .108E-04 \quad .180E-05$

$2s^2 1S \rightarrow 2s3d^3D \quad E_0 = 77.48 \quad E_1 = 25.41 \quad E_{01} = 52.07 \text{ (eV)}$

$X = 1.10 \quad 1.17 \quad 1.29 \quad 1.50 \quad 1.83 \quad 2.40$   
 $STR = .222E+00 \quad .200E+00 \quad .170E+00 \quad .134E+00 \quad .956E-01 \quad .603E-01$   
 $SIG = .526E-01 \quad .445E-01 \quad .344E-01 \quad .234E-01 \quad .137E-01 \quad .656E-02$   
 $ABCDE = .225E+03 \quad .632E+04 \quad -.109E+05 \quad .611E+04 \quad .000E+00$   
 $X = 3.34 \quad 4.91 \quad 7.58 \quad 12.04$   
 $STR = .326E-01 \quad .148E-01 \quad .536E-02 \quad .142E-02$   
 $SIG = .255E-02 \quad .785E-03 \quad .185E-03 \quad .309E-04$

$2s^2 1S \rightarrow 2s4d^3D \quad E_0 = 77.48 \quad E_1 = 14.06 \quad E_{01} = 63.41 \text{ (eV)}$

$X = 1.10 \quad 1.18 \quad 1.29 \quad 1.49 \quad 1.83 \quad 2.40$   
 $STR = .696E-01 \quad .620E-01 \quad .520E-01 \quad .402E-01 \quad .281E-01 \quad .173E-01$   
 $SIG = .135E-01 \quad .113E-01 \quad .861E-02 \quad .577E-02 \quad .329E-02 \quad .155E-02$   
 $ABCDE = .465E+02 \quad .256E+04 \quad -.464E+04 \quad .262E+04 \quad .000E+00$   
 $X = 3.34 \quad 4.92 \quad 7.58 \quad 12.03$   
 $STR = .911E-02 \quad .396E-02 \quad .137E-02 \quad .329E-03$   
 $SIG = .585E-03 \quad .173E-03 \quad .388E-04 \quad .586E-05$



$2s^2 1S \rightarrow 2s5d^3D$ $E_0 = 77.48$ $E_1 = 8.95$ $E_{01} = 68.53$ (eV)							
$X$	=	1.10	1.18	1.29	1.49	1.82	2.39
$STR$	=	.315E-01	.279E-01	.232E-01	.178E-01	.124E-01	.756E-02
$SIG$	=	.566E-02	.471E-02	.356E-02	.237E-02	.135E-02	.627E-03
$ABCDE$	=	.113E+02	.131E+04	-.243E+04	.138E+04	.000E+00	
$X$	=	3.34	4.92	7.57	12.03		
$STR$	=	.393E-02	.168E-02	.570E-03	.128E-03		
$SIG$	=	.234E-03	.680E-04	.149E-04	.212E-05		
$2s^2 1S \rightarrow 2s6d^3D$ $E_0 = 77.48$ $E_1 = 6.18$ $E_{01} = 71.30$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.84	2.40
$STR$	=	.171E-01	.151E-01	.125E-01	.968E-02	.666E-02	.404E-02
$SIG$	=	.295E-02	.245E-02	.185E-02	.123E-02	.691E-03	.322E-03
$ABCDE$	=	.359E+01	.751E+03	-.138E+04	.771E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.03		
$STR$	=	.208E-02	.887E-03	.295E-03	.643E-04		
$SIG$	=	.119E-03	.344E-04	.744E-05	.102E-05		
$2s^2 1S \rightarrow 2s7d^3D$ $E_0 = 77.48$ $E_1 = 4.53$ $E_{01} = 72.95$ (eV)							
$X$	=	1.10	1.18	1.30	1.49	1.84	2.40
$STR$	=	.104E-01	.913E-02	.757E-02	.582E-02	.402E-02	.243E-02
$SIG$	=	.175E-02	.145E-02	.109E-02	.727E-03	.408E-03	.189E-03
$ABCDE$	=	.154E+01	.465E+03	-.853E+03	.477E+03	.000E+00	
$X$	=	3.33	4.92	7.58	12.04		
$STR$	=	.123E-02	.524E-03	.174E-03	.372E-04		
$SIG$	=	.691E-04	.199E-04	.428E-05	.577E-06		
$2s^2 1S \rightarrow 2s8d^3D$ $E_0 = 77.48$ $E_1 = 3.46$ $E_{01} = 74.02$ (eV)							
$X$	=	1.10	1.18	1.30	1.50	1.82	2.39
$STR$	=	.676E-02	.599E-02	.496E-02	.379E-02	.259E-02	.156E-02
$SIG$	=	.112E-02	.937E-03	.703E-03	.465E-03	.261E-03	.120E-03
$ABCDE$	=	.438E+00	.309E+03	-.570E+03	.320E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.03		
$STR$	=	.799E-03	.337E-03	.113E-03	.228E-04		
$SIG$	=	.440E-04	.126E-04	.273E-05	.348E-06		
$2s^2 1S \rightarrow 2s9d^3D$ $E_0 = 77.48$ $E_1 = 2.72$ $E_{01} = 74.76$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.39
$STR$	=	.466E-02	.409E-02	.339E-02	.259E-02	.179E-02	.109E-02
$SIG$	=	.768E-03	.633E-03	.476E-03	.315E-03	.178E-03	.826E-04
$ABCDE$	=	-.437E+00	.223E+03	-.414E+03	.232E+03	.000E+00	
$X$	=	3.33	4.92	7.57	12.04		
$STR$	=	.552E-03	.233E-03	.760E-04	.157E-04		
$SIG$	=	.302E-04	.861E-05	.183E-05	.237E-06		
$2s^2 1S \rightarrow 2s4f^3F^0$ $E_0 = 77.48$ $E_1 = 13.61$ $E_{01} = 63.87$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.40
$STR$	=	.238E-01	.205E-01	.162E-01	.114E-01	.685E-02	.345E-02
$SIG$	=	.460E-02	.371E-02	.266E-02	.162E-02	.797E-03	.307E-03
$ABCDE$	=	-.206E+02	.382E+03	-.307E+03	.128E+03	.000E+00	
$X$	=	3.33	4.92	7.58	12.04		
$STR$	=	.138E-02	.411E-03	.934E-04	.176E-04		
$SIG$	=	.879E-04	.178E-04	.262E-05	.311E-06		
$2s^2 1S \rightarrow 2s5f^3F^0$ $E_0 = 77.48$ $E_1 = 8.71$ $E_{01} = 68.77$ (eV)							
$X$	=	1.10	1.17	1.29	1.50	1.83	2.40
$STR$	=	.156E-01	.133E-01	.105E-01	.736E-02	.442E-02	.222E-02
$SIG$	=	.279E-02	.224E-02	.161E-02	.973E-03	.477E-03	.183E-03
$ABCDE$	=	-.155E+02	.281E+03	-.248E+03	.102E+03	.000E+00	

<i>X</i>	=	3.33	4.91	7.58	12.04		
<i>STR</i>	=	.879E-03	.262E-03	.583E-04	.105E-04		
<i>SIG</i>	=	.522E-04	.105E-04	.152E-05	.172E-06		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s3s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 29.26 E<sub>01</sub> = 39.88 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.29	1.49	1.83	2.39
<i>STR</i>	=	.484E-01	.453E-01	.404E-01	.339E-01	.259E-01	.179E-01
<i>SIG</i>	=	.166E-02	.146E-02	.118E-02	.859E-03	.537E-03	.283E-03
<i>ABCDE</i>	=	.227E+03	.449E+03	-.980E+03	.587E+03	.000E+00	
<i>X</i>	=	3.33	4.91	7.57	12.04		
<i>STR</i>	=	.108E-01	.574E-02	.261E-02	.933E-03		
<i>SIG</i>	=	.123E-03	.443E-04	.131E-04	.294E-05		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s4s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 16.09 E<sub>01</sub> = 53.05 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.29	1.49	1.83	2.39
<i>STR</i>	=	.198E-01	.181E-01	.157E-01	.124E-01	.882E-02	.550E-02
<i>SIG</i>	=	.511E-03	.439E-03	.345E-03	.237E-03	.137E-03	.654E-04
<i>ABCDE</i>	=	.577E+02	.331E+03	-.591E+03	.323E+03	.000E+00	
<i>X</i>	=	3.34	4.92	7.58	12.03		
<i>STR</i>	=	.298E-02	.140E-02	.563E-03	.174E-03		
<i>SIG</i>	=	.254E-04	.814E-05	.212E-05	.413E-06		
<i>2s<sup>2</sup>1S2s2p<sup>3</sup>P<sup>0</sup> → 2s5s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 9.69 E<sub>01</sub> = 59.45 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.30	1.50	1.83	2.39
<i>STR</i>	=	.767E-02	.698E-02	.602E-02	.477E-02	.340E-02	.214E-02
<i>SIG</i>	=	.176E-03	.151E-03	.118E-03	.811E-04	.472E-04	.228E-04
<i>ABCDE</i>	=	.201E+02	.203E+03	-.398E+03	.226E+03	.000E+00	
<i>X</i>	=	3.34	4.93	7.59	12.03		
<i>STR</i>	=	.116E-02	.543E-03	.210E-03	.573E-04		
<i>SIG</i>	=	.889E-05	.280E-05	.703E-06	.121E-06		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s6s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 6.66 E<sub>01</sub> = 62.48 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.29	1.49	1.82	2.40
<i>STR</i>	=	.450E-02	.407E-02	.347E-02	.269E-02	.188E-02	.115E-02
<i>SIG</i>	=	.986E-04	.837E-04	.648E-04	.436E-04	.249E-04	.116E-04
<i>ABCDE</i>	=	.927E+01	.124E+03	-.235E+03	.132E+03	.000E+00	
<i>X</i>	=	3.35	4.91	7.57	12.04		
<i>STR</i>	=	.612E-03	.278E-03	.103E-03	.277E-04		
<i>SIG</i>	=	.443E-05	.137E-05	.329E-06	.557E-07		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s7s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 4.92 E<sub>01</sub> = 64.22 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.30	1.49	1.84	2.40
<i>STR</i>	=	.318E-02	.286E-02	.240E-02	.184E-02	.124E-02	.726E-03
<i>SIG</i>	=	.677E-04	.573E-04	.436E-04	.289E-04	.159E-04	.713E-05
<i>ABCDE</i>	=	.581E+01	.709E+02	-.120E+03	.639E+02	.000E+00	
<i>X</i>	=	3.33	4.92	7.58	12.04		
<i>STR</i>	=	.366E-03	.162E-03	.598E-04	.159E-04		
<i>SIG</i>	=	.258E-05	.775E-06	.186E-06	.311E-07		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s8s<sup>1</sup>S E<sub>0</sub> = 69.14 E<sub>1</sub> = 3.57 E<sub>01</sub> = 65.57 (eV)</i>							
<i>X</i>	=	1.10	1.18	1.29	1.49	1.83	2.39
<i>STR</i>	=	.131E-02	.121E-02	.106E-02	.863E-03	.641E-03	.416E-03
<i>SIG</i>	=	.273E-04	.236E-04	.188E-04	.133E-04	.807E-05	.400E-05
<i>ABCDE</i>	=	.272E+01	.601E+02	-.124E+03	.703E+02	.000E+00	
<i>X</i>	=	3.34	4.93	7.58	12.03		
<i>STR</i>	=	.229E-03	.105E-03	.381E-04	.941E-05		
<i>SIG</i>	=	.158E-05	.492E-06	.116E-06	.180E-07		

$2s2p^3P^0 \rightarrow 2s3p^1P^0$ $E_0 = 69.14$ $E_1 = 27.47$ $E_{01} = 41.67$ (eV)							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.831E-01	.834E-01	.827E-01	.794E-01	.708E-01	.556E-01
$SIG$	=	.273E-02	.257E-02	.231E-02	.193E-02	.140E-02	.843E-03
$ABCDE$	=	.441E+03	.427E+04	-.965E+04	.550E+04	.000E+00	
$X$	=	3.34	4.92	7.58	12.02		
$STR$	=	.360E-01	.186E-01	.756E-02	.243E-02		
$SIG$	=	.392E-03	.137E-03	.362E-04	.732E-05		
$2s2p^3P^0 \rightarrow 2s4p^1P^0$ $E_0 = 69.14$ $E_1 = 14.91$ $E_{01} = 54.23$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.40
$STR$	=	.299E-01	.301E-01	.296E-01	.277E-01	.233E-01	.168E-01
$SIG$	=	.754E-03	.713E-03	.637E-03	.517E-03	.355E-03	.195E-03
$ABCDE$	=	.823E+02	.199E+04	-.405E+04	.217E+04	.000E+00	
$X$	=	3.34	4.92	7.58	12.04		
$STR$	=	.973E-02	.443E-02	.160E-02	.461E-03		
$SIG$	=	.813E-04	.251E-04	.587E-05	.107E-05		
$2s2p^3P^0 \rightarrow 2s5p^1P$ $E_0 = 69.14$ $E_1 = 9.36$ $E_{01} = 59.78$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.82	2.39
$STR$	=	.142E-01	.143E-01	.140E-01	.129E-01	.106E-01	.736E-02
$SIG$	=	.326E-03	.308E-03	.274E-03	.219E-03	.147E-03	.778E-04
$ABCDE$	=	.216E+02	.104E+04	-.205E+04	.108E+04	.000E+00	
$X$	=	3.35	4.92	7.58	12.03		
$STR$	=	.409E-02	.178E-02	.612E-03	.164E-03		
$SIG$	=	.309E-04	.914E-05	.204E-05	.346E-06		
$2s2p^3P^0 \rightarrow 2s6p^1P^0$ $E_0 = 69.14$ $E_1 = 6.42$ $E_{01} = 62.72$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.39
$STR$	=	.792E-02	.793E-02	.775E-02	.711E-02	.578E-02	.392E-02
$SIG$	=	.173E-03	.163E-03	.144E-03	.115E-03	.760E-04	.395E-04
$ABCDE$	=	.843E+01	.594E+03	-.115E+04	.600E+03	.000E+00	
$X$	=	3.33	4.93	7.57	12.04		
$STR$	=	.213E-02	.909E-03	.310E-03	.787E-04		
$SIG$	=	.154E-04	.445E-05	.987E-06	.158E-06		
$2s2p^3P^0 \rightarrow 2s7p^1P^0$ $E_0 = 69.14$ $E_1 = 4.68$ $E_{01} = 64.46$ (eV)							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.485E-02	.485E-02	.474E-02	.432E-02	.350E-02	.234E-02
$SIG$	=	.103E-03	.968E-04	.858E-04	.677E-04	.449E-04	.230E-04
$ABCDE$	=	.413E+01	.368E+03	-.708E+03	.366E+03	.000E+00	
$X$	=	3.34	4.92	7.59	12.04		
$STR$	=	.126E-02	.530E-03	.178E-03	.450E-04		
$SIG$	=	.888E-05	.253E-05	.551E-06	.876E-07		
$2s2p^3P^0 \rightarrow 2s8p^1P^0$ $E_0 = 69.14$ $E_1 = 3.55$ $E_{01} = 65.59$ (eV)							
$X$	=	1.10	1.18	1.29	1.49	1.83	2.39
$STR$	=	.318E-02	.320E-02	.312E-02	.283E-02	.227E-02	.152E-02
$SIG$	=	.664E-04	.628E-04	.556E-04	.437E-04	.286E-04	.147E-04
$ABCDE$	=	.174E+01	.249E+03	-.478E+03	.247E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.03		
$STR$	=	.811E-03	.340E-03	.113E-03	.279E-04		
$SIG$	=	.560E-05	.159E-05	.343E-06	.535E-07		
$2s2p^3P^0 \rightarrow 2s9p^1P^0$ $E_0 = 69.14$ $E_1 = 2.79$ $E_{01} = 66.35$ (eV)							
$X$	=	1.10	1.18	1.29	1.50	1.82	2.40
$STR$	=	.221E-02	.220E-02	.215E-02	.195E-02	.157E-02	.104E-02
$SIG$	=	.456E-04	.426E-04	.378E-04	.297E-04	.196E-04	.990E-05
$ABCDE$	=	.596E+00	.175E+03	-.334E+03	.173E+03	.000E+00	

<i>X</i>	=	3.33	4.91	7.58	12.03		
<i>STR</i>	=	.555E-03	.230E-03	.751E-04	.185E-04		
<i>SIG</i>	=	.380E-05	.106E-05	.226E-06	.350E-07		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s3d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 24.27$ $E_{01} = 44.87$ (eV)							
<i>X</i>	=	1.11	1.18	1.29	1.50	1.83	2.38
<i>STR</i>	=	.249E+00	.232E+00	.205E+00	.168E+00	.122E+00	.742E-01
<i>SIG</i>	=	.760E-02	.664E-02	.534E-02	.379E-02	.224E-02	.105E-02
<i>ABCDE</i>	=	.815E+02	.528E+04	-.688E+04	.290E+04	.000E+00	
<i>X</i>	=	3.34	4.93	7.58	12.04		
<i>STR</i>	=	.371E-01	.150E-01	.507E-02	.145E-02		
<i>SIG</i>	=	.374E-03	.103E-03	.225E-04	.406E-05		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s4d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 13.67$ $E_{01} = 55.47$ (eV)							
<i>X</i>	=	1.11	1.18	1.29	1.49	1.83	2.40
<i>STR</i>	=	.945E-01	.873E-01	.764E-01	.610E-01	.427E-01	.247E-01
<i>SIG</i>	=	.233E-02	.202E-02	.161E-02	.111E-02	.633E-03	.281E-03
<i>ABCDE</i>	=	.103E+02	.225E+04	-.286E+04	.112E+04	.000E+00	
<i>X</i>	=	3.34	4.92	7.57	12.04		
<i>STR</i>	=	.115E-01	.441E-02	.441E-02	.374E-03		
<i>SIG</i>	=	.941E-04	.244E-04	.509E-05	.845E-06		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s5d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 8.75$ $E_{01} = 60.39$ (eV)							
<i>X</i>	=	1.10	1.18	1.29	1.50	1.84	2.40
<i>STR</i>	=	.460E-01	.423E-01	.368E-01	.291E-01	.200E-01	.113E-01
<i>SIG</i>	=	.104E-02	.902E-03	.712E-03	.487E-03	.272E-03	.118E-03
<i>ABCDE</i>	=	-.243E+01	.118E+04	-.151E+04	.585E+03	.000E+00	
<i>X</i>	=	3.34	4.92	7.58	12.04		
<i>STR</i>	=	.518E-02	.192E-02	.603E-03	.153E-03		
<i>SIG</i>	=	.388E-04	.980E-05	.199E-05	.317E-06		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s5d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 8.75$ $E_{01} = 60.39$ (eV)							
<i>X</i>	=	1.11	1.17	1.30	1.50	1.82	2.39
<i>STR</i>	=	.259E-01	.238E-01	.206E-01	.162E-01	.109E-01	.615E-02
<i>SIG</i>	=	.561E-03	.485E-03	.381E-03	.260E-03	.144E-03	.616E-04
<i>ABCDE</i>	=	-.114E+01	.660E+03	-.836E+03	.321E+03	.000E+00	
<i>X</i>	=	3.33	4.92	7.58	12.03		
<i>STR</i>	=	.277E-02	.102E-02	.318E-03	.783E-04		
<i>SIG</i>	=	.200E-04	.500E-05	.101E-05	.156E-06		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s7d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 4.46$ $E_{01} = 64.68$ (eV)							
<i>X</i>	=	1.10	1.18	1.29	1.50	1.82	2.40
<i>STR</i>	=	.160E-01	.147E-01	.127E-01	.995E-02	.671E-02	.374E-02
<i>SIG</i>	=	.338E-03	.292E-03	.229E-03	.156E-03	.859E-04	.365E-04
<i>ABCDE</i>	=	-.143E+01	.419E+03	-.533E+03	.204E+03	.000E+00	
<i>X</i>	=	3.34	4.92	7.58	12.03		
<i>STR</i>	=	.167E-02	.614E-03	.190E-03	.466E-04		
<i>SIG</i>	=	.117E-04	.292E-05	.587E-06	.906E-07		
<i>2s2p<sup>3</sup>P<sup>0</sup> → 2s8d<sup>1</sup>D</i> $E_0 = 69.14$ $E_1 = 3.42$ $E_{01} = 65.72$ (eV)							
<i>X</i>	=	1.10	1.18	1.29	1.50	1.83	2.39
<i>STR</i>	=	.106E-01	.969E-02	.836E-02	.652E-02	.437E-02	.242E-02
<i>SIG</i>	=	.220E-03	.189E-03	.148E-03	.100E-03	.550E-04	.233E-04
<i>ABCDE</i>	=	-.950E+00	.273E+03	-.342E+03	.129E+03	.000E+00	
<i>X</i>	=	3.33	4.91	7.58	12.04		
<i>STR</i>	=	.108E-02	.394E-03	.121E-03	.291E-04		
<i>SIG</i>	=	.745E-05	.184E-05	.369E-06	.555E-07		

$2s2p^3P^0 \rightarrow 2s9d^1D$ $E_0 = 69.14$ $E_1 = 2.70$ $E_{01} = 66.44$ (eV)							
$X$	=	1.10	1.18	1.29	1.49	1.84	2.39
$STR$	=	.737E-02	.683E-02	.583E-02	.455E-02	.307E-02	.169E-02
$SIG$	=	.152E-03	.132E-03	.103E-03	.693E-04	.381E-04	.161E-04
$ABCDE$	=	-.132E+01	.199E+03	-.253E+03	.964E+02	.000E+00	
$X$	=	3.34	4.92	7.57	12.04		
$STR$	=	.752E-03	.275E-03	.838E-04	.201E-04		
$SIG$	=	.512E-05	.127E-05	.252E-06	.380E-07		
$2s2p^3P^0 \rightarrow 2s4f^1F$ $E_0 = 69.14$ $E_1 = 13.61$ $E_{01} = 55.53$ (eV)							
$X$	=	1.10	1.18	1.29	1.49	1.84	2.39
$STR$	=	.317E-01	.278E-01	.224E-01	.158E-01	.942E-02	.446E-02
$SIG$	=	.781E-03	.644E-03	.471E-03	.288E-03	.140E-03	.507E-04
$ABCDE$	=	-.127E+02	.253E+03	.661E+02	-.126E+03	.000E+00	
$X$	=	3.33	4.92	7.58	12.03		
$STR$	=	.166E-02	.487E-03	.113E-03	.198E-04		
$SIG$	=	.135E-04	.270E-05	.407E-06	.448E-07		
$2s2p^3P^0 \rightarrow 2s5f^1F$ $E_0 = 69.14$ $E_1 = 8.71$ $E_{01} = 60.43$ (eV)							
$X$	=	1.10	1.17	1.29	1.49	1.84	2.40
$STR$	=	.205E-01	.179E-01	.143E-01	.100E-01	.588E-02	.274E-02
$SIG$	=	.465E-03	.382E-03	.277E-03	.168E-03	.801E-04	.285E-04
$ABCDE$	=	-.987E+01	.185E+03	.142E+02	-.707E+02	.000E+00	
$X$	=	3.34	4.91	7.58	12.03		
$STR$	=	.100E-02	.289E-03	.661E-04	.111E-04		
$SIG$	=	.751E-05	.147E-05	.218E-06	.230E-07		
$2s2p^3P^0 \rightarrow 2s6f^1F^0$ $E_0 = 69.14$ $E_1 = 6.05$ $E_{01} = 63.09$ (eV)							
$X$	=	1.10	1.18	1.30	1.49	1.82	2.39
$STR$	=	.136E-01	.118E-01	.941E-02	.658E-02	.381E-02	.178E-02
$SIG$	=	.294E-03	.240E-03	.174E-03	.105E-03	.501E-04	.178E-04
$ABCDE$	=	-.675E+01	.130E+03	-.744E+01	-.366E+02	.000E+00	
$X$	=	3.34	4.91	7.58	12.03		
$STR$	=	.654E-03	.188E-03	.430E-04	.716E-05		
$SIG$	=	.468E-05	.916E-06	.136E-06	.143E-07		

### 7.6 $NV$ Direct Transitions

$1s^22s^2S \rightarrow 1s^23s^2S$ $E_0 = 97.90$ $E_1 = 41.40$ $E_{01} = 56.50$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.247E+00	.250E+00	.259E+00	.270E+00	.284E+00	.298E+00
$SIG$	=	.270E-01	.251E-01	.223E-01	.182E-01	.132E-01	.864E-02
$ABCDE$	=	.321E+00	-.955E-01	-.265E-02	.193E-01	.000E+00	
$X$	=	7.29	13.56	26.02	50.80		
$STR$	=	.309E+00	.314E+00	.314E+00	.318E+00		
$SIG$	=	.511E-02	.279E-02	.146E-02	.754E-03		
$1s^22s^2S \rightarrow 1s^24s^2S$ $E_0 = 97.90$ $E_1 = 22.72$ $E_{01} = 75.17$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.498E-01	.505E-01	.521E-01	.538E-01	.564E-01	.592E-01
$SIG$	=	.409E-02	.381E-02	.337E-02	.271E-02	.198E-02	.129E-02
$ABCDE$	=	.630E-01	-.179E-01	.212E-02	.171E-02	.000E+00	
$X$	=	7.29	13.57	26.07	50.82		
$STR$	=	.613E-01	.603E-01	.623E-01	.627E-01		
$SIG$	=	.761E-03	.402E-03	.216E-03	.112E-03		

$1s^2 2s^2 S \rightarrow 1s^2 5s^2 S \quad E_0 = 97.90 \quad E_1 = 14.35 \quad E_{01} = 83.54 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.59	4.15
<i>STR</i>	=	.193E-01	.195E-01	.200E-01	.207E-01	.215E-01	.226E-01
<i>SIG</i>	=	.143E-02	.133E-02	.116E-02	.938E-03	.679E-03	.442E-03
<i>ABCDE</i>	=	.241E-01	-.706E-02	.139E-02	.579E-03	.000E+00	
<i>X</i>	=	7.30	13.53	25.98	50.87		
<i>STR</i>	=	.234E-01	.232E-01	.236E-01	.240E-01		
<i>SIG</i>	=	.261E-03	.140E-03	.741E-04	.384E-04		
$1s^2 2s^2 S \rightarrow 1s^2 6s^2 S \quad E_0 = 97.90 \quad E_1 = 9.86 \quad E_{01} = 88.03 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.59	4.16
<i>STR</i>	=	.968E-02	.985E-02	.100E-01	.103E-01	.108E-01	.112E-01
<i>SIG</i>	=	.680E-03	.632E-03	.554E-03	.444E-03	.322E-03	.207E-03
<i>ABCDE</i>	=	.121E-01	-.406E-02	.205E-02	-.495E-03	.000E+00	
<i>X</i>	=	7.29	13.52	26.01	50.89		
<i>STR</i>	=	.116E-01	.117E-01	.118E-01	.120E-01		
<i>SIG</i>	=	.123E-03	.671E-04	.351E-04	.182E-04		
$1s^2 2s^2 S \rightarrow 1s^2 7s^2 S \quad E_0 = 97.90 \quad E_1 = 7.21 \quad E_{01} = 90.68 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.58	4.16
<i>STR</i>	=	.562E-02	.569E-02	.579E-02	.598E-02	.618E-02	.649E-02
<i>SIG</i>	=	.383E-03	.355E-03	.310E-03	.250E-03	.180E-03	.117E-03
<i>ABCDE</i>	=	.694E-02	-.202E-02	.290E-03	.378E-03	.000E+00	
<i>X</i>	=	7.30	13.56	26.02	50.84		
<i>STR</i>	=	.670E-02	.684E-02	.678E-02	.687E-02		
<i>SIG</i>	=	.689E-04	.378E-04	.195E-04	.101E-04		
$1s^2 2s^2 S \rightarrow 1s^2 8s^2 S \quad E_0 = 97.90 \quad E_1 = 5.51 \quad E_{01} = 92.38 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.59	4.16
<i>STR</i>	=	.358E-02	.362E-02	.367E-02	.378E-02	.393E-02	.409E-02
<i>SIG</i>	=	.239E-03	.222E-03	.194E-03	.155E-03	.112E-03	.725E-04
<i>ABCDE</i>	=	.440E-02	-.136E-02	.360E-03	.165E-03	.000E+00	
<i>X</i>	=	7.29	13.53	25.97	50.86		
<i>STR</i>	=	.423E-02	.430E-02	.431E-02	.437E-02		
<i>SIG</i>	=	.427E-04	.234E-04	.122E-04	.632E-05		
$1s^2 2s^2 S \rightarrow 1s^2 9s^2 S \quad E_0 = 97.90 \quad E_1 = 4.32 \quad E_{01} = 93.58 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.59	4.16
<i>STR</i>	=	.242E-02	.244E-02	.250E-02	.256E-02	.266E-02	.277E-02
<i>SIG</i>	=	.160E-03	.148E-03	.130E-03	.104E-03	.749E-04	.484E-04
<i>ABCDE</i>	=	.297E-02	-.932E-03	.357E-03	.209E-05	.000E+00	
<i>X</i>	=	7.30	13.57	25.97	50.86		
<i>STR</i>	=	.285E-02	.293E-02	.290E-02	.294E-02		
<i>SIG</i>	=	.284E-04	.157E-04	.813E-05	.421E-05		
$1s^2 2s^2 S \rightarrow 1s^2 2p^2 P^0 \quad E_0 = 97.90 \quad E_1 = 87.89 \quad E_{01} = 10.00 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.59	4.16
<i>STR</i>	=	.674E+01	.681E+01	.703E+01	.724E+01	.722E+01	.781E+01
<i>SIG</i>	=	.417E+01	.386E+01	.342E+01	.274E+01	.190E+01	.128E+01
<i>ABCDE</i>	=	.738E+00	.757E+01	.320E+01	-.522E+01	.358E+01	
<i>X</i>	=	7.29	13.59	25.97	50.85		
<i>STR</i>	=	.886E+01	.106E+02	.128E+02	.151E+02		
<i>SIG</i>	=	.825E+00	.530E+00	.334E+00	.202E+00		
$1s^2 2s^2 S \rightarrow 1s^2 3p^2 P^0 \quad E_0 = 97.90 \quad E_1 = 38.64 \quad E_{01} = 59.25 \text{ (eV)}$							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.58	4.15
<i>STR</i>	=	.935E-01	.103E+00	.119E+00	.157E+00	.227E+00	.333E+00
<i>SIG</i>	=	.976E-02	.981E-02	.979E-02	.101E-01	.101E-01	.922E-02
<i>ABCDE</i>	=	-.464E+00	.610E+00	.207E+00	-.286E+00	.453E+00	

$X$	=	7.29	13.55	25.99	50.80		
$STR$	=	.508E+00	.764E+00	.105E+01	.133E+01		
$SIG$	=	.801E-02	.647E-02	.462E-02	.301E-02		
$1s^2 2s^2 S \rightarrow 1s^2 4p^2 P^0$ $E_0 = 97.90$ $E_1 = 21.63$ $E_{01} = 76.26$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.15
$STR$	=	.311E-01	.332E-01	.376E-01	.476E-01	.664E-01	.938E-01
$SIG$	=	.252E-02	.247E-02	.239E-02	.236E-02	.229E-02	.201E-02
$ABCDE$	=	-.748E-01	.799E-01	.104E+00	-.849E-01	.102E+00	
$X$	=	7.30	13.50	25.95	50.85		
$STR$	=	.137E+00	.198E+00	.263E+00	.329E+00		
$SIG$	=	.167E-02	.131E-02	.904E-03	.576E-03		
$1s^2 2s^2 S \rightarrow 1s^2 5p^2 P^0$ $E_0 = 97.90$ $E_1 = 13.78$ $E_{01} = 84.12$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.146E-01	.152E-01	.169E-01	.208E-01	.286E-01	.404E-01
$SIG$	=	.107E-02	.102E-02	.974E-03	.939E-03	.896E-03	.785E-03
$ABCDE$	=	-.240E-01	.197E-01	.534E-01	-.368E-01	.402E-01	
$X$	=	7.30	13.55	26.03	50.88		
$STR$	=	.580E-01	.829E-01	.109E+00	.135E+00		
$SIG$	=	.642E-03	.495E-03	.338E-03	.214E-03		
$1s^2 2s^2 S \rightarrow 1s^2 6p^2 P^0$ $E_0 = 97.90$ $E_1 = 9.56$ $E_{01} = 88.34$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.15
$STR$	=	.799E-02	.829E-02	.916E-02	.111E-01	.151E-01	.212E-01
$SIG$	=	.559E-03	.532E-03	.502E-03	.477E-03	.451E-03	.393E-03
$ABCDE$	=	-.969E-02	.270E-02	.373E-01	-.236E-01	.200E-01	
$X$	=	7.30	13.58	26.04	50.83		
$STR$	=	.304E-01	.432E-01	.563E-01	.692E-01		
$SIG$	=	.320E-03	.245E-03	.166E-03	.105E-03		
$1s^2 2s^2 S \rightarrow 1s^2 7p^2 P^0$ $E_0 = 97.90$ $E_1 = 7.01$ $E_{01} = 90.89$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.489E-02	.507E-02	.556E-02	.673E-02	.905E-02	.126E-01
$SIG$	=	.333E-03	.316E-03	.298E-03	.281E-03	.262E-03	.228E-03
$ABCDE$	=	-.563E-02	.241E-02	.204E-01	-.130E-01	.118E-01	
$X$	=	7.29	13.53	25.97	50.83		
$STR$	=	.180E-01	.254E-01	.331E-01	.407E-01		
$SIG$	=	.185E-03	.141E-03	.954E-04	.600E-04		
$1s^2 2s^2 S \rightarrow 1s^2 8p^2 P^0$ $E_0 = 97.90$ $E_1 = 5.37$ $E_{01} = 92.52$ (eV)							
$X$	=	1.10	1.20	1.39	1.79	2.58	4.16
$STR$	=	.324E-02	.332E-02	.362E-02	.438E-02	.590E-02	.820E-02
$SIG$	=	.216E-03	.203E-03	.191E-03	.179E-03	.168E-03	.145E-03
$ABCDE$	=	-.327E-02	.887E-03	.135E-01	-.834E-02	.746E-02	
$X$	=	7.30	13.51	26.05	50.91		
$STR$	=	.116E-01	.164E-01	.213E-01	.261E-01		
$SIG$	=	.117E-03	.890E-04	.602E-04	.378E-04		
$1s^2 2s^2 S \rightarrow 1s^2 3d^2 D$ $E_0 = 97.90$ $E_1 = 37.82$ $E_{01} = 60.07$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.442E+00	.449E+00	.465E+00	.488E+00	.520E+00	.594E+00
$SIG$	=	.454E-01	.424E-01	.376E-01	.308E-01	.228E-01	.162E-01
$ABCDE$	=	.912E+00	-.173E+01	.231E+01	-.107E+01	.000E+00	
$X$	=	7.29	13.55	25.97	50.77		
$STR$	=	.724E+00	.825E+00	.862E+00	.868E+00		
$SIG$	=	.112E-01	.689E-02	.376E-02	.194E-02		

$1s^2 2s^2 S \rightarrow 1s^2 4d^2 D$ $E_0 = 97.90$ $E_1 = 21.29$ $E_{01} = 76.60$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.977E-01	.977E-01	.979E-01	.100E+00	.103E+00	.112E+00
$SIG$	=	.789E-02	.723E-02	.622E-02	.494E-02	.355E-02	.238E-02
$ABCDE$	=	.160E+00	-.262E+00	.368E+00	-.171E+00	.000E+00	
$X$	=	7.29	13.57	25.97	50.89		
$STR$	=	.131E+00	.148E+00	.152E+00	.153E+00		
$SIG$	=	.159E-02	.967E-03	.520E-03	.267E-03		
$1s^2 2s^2 S \rightarrow 1s^2 5d^2 D$ $E_0 = 97.90$ $E_1 = 13.61$ $E_{01} = 84.29$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.393E-01	.386E-01	.384E-01	.382E-01	.390E-01	.415E-01
$SIG$	=	.288E-02	.260E-02	.221E-02	.172E-02	.122E-02	.805E-03
$ABCDE$	=	.576E-01	-.895E-01	.129E+00	-.587E-01	.000E+00	
$X$	=	7.30	13.52	25.98	50.90		
$STR$	=	.476E-01	.535E-01	.551E-01	.554E-01		
$SIG$	=	.527E-03	.319E-03	.171E-03	.878E-04		
$1s^2 2s^2 S \rightarrow 1s^2 6d^2 D$ $E_0 = 97.90$ $E_1 = 9.46$ $E_{01} = 88.44$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.202E-01	.197E-01	.195E-01	.191E-01	.193E-01	.204E-01
$SIG$	=	.141E-02	.127E-02	.107E-02	.819E-03	.574E-03	.377E-03
$ABCDE$	=	.280E-01	-.423E-01	.626E-01	-.281E-01	.000E+00	
$X$	=	7.29	13.57	26.01	50.88		
$STR$	=	.233E-01	.260E-01	.268E-01	.269E-01		
$SIG$	=	.246E-03	.148E-03	.794E-04	.406E-04		
$1s^2 2s^2 S \rightarrow 1s^2 6d^2 D$ $E_0 = 97.90$ $E_1 = 9.46$ $E_{01} = 88.44$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.119E-01	.116E-01	.113E-01	.110E-01	.110E-01	.116E-01
$SIG$	=	.807E-03	.725E-03	.605E-03	.461E-03	.319E-03	.209E-03
$ABCDE$	=	.159E-01	-.242E-01	.364E-01	-.162E-01	.000E+00	
$X$	=	7.30	13.52	26.06	50.90		
$STR$	=	.132E-01	.148E-01	.153E-01	.152E-01		
$SIG$	=	.136E-03	.816E-04	.439E-04	.224E-04		
$1s^2 2s^2 S \rightarrow 1s^2 8d^2 D$ $E_0 = 97.90$ $E_1 = 5.31$ $E_{01} = 92.59$ (eV)							
$X$	=	1.10	1.20	1.39	1.79	2.58	4.16
$STR$	=	.764E-02	.743E-02	.716E-02	.703E-02	.703E-02	.737E-02
$SIG$	=	.510E-03	.456E-03	.378E-03	.288E-03	.200E-03	.130E-03
$ABCDE$	=	.998E-02	-.145E-01	.212E-01	-.886E-02	.000E+00	
$X$	=	7.30	13.50	26.03	50.87		
$STR$	=	.838E-02	.931E-02	.958E-02	.963E-02		
$SIG$	=	.843E-04	.507E-04	.270E-04	.139E-04		
$1s^2 2s^2 S \rightarrow 1s^2 4f^2 F^0$ $E_0 = 97.90$ $E_1 = 21.26$ $E_{01} = 76.64$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.450E-01	.419E-01	.376E-01	.330E-01	.323E-01	.389E-01
$SIG$	=	.363E-02	.310E-02	.239E-02	.163E-02	.111E-02	.830E-03
$ABCDE$	=	.447E-01	-.265E-01	-.191E-01	.548E-01	.000E+00	
$X$	=	7.29	13.57	25.97	50.89		
$STR$	=	.427E-01	.433E-01	.432E-01	.438E-01		
$SIG$	=	.520E-03	.283E-03	.148E-03	.763E-04		
$1s^2 2s^2 S \rightarrow 1s^2 5f^2 F^0$ $E_0 = 97.90$ $E_1 = 13.61$ $E_{01} = 84.29$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.253E-01	.235E-01	.209E-01	.179E-01	.173E-01	.205E-01
$SIG$	=	.186E-02	.158E-02	.120E-02	.808E-03	.540E-03	.397E-03
$ABCDE$	=	.236E-01	-.152E-01	-.470E-02	.266E-01	.000E+00	



$X$	=	7.30	13.52	25.98	50.90		
$STR$	=	.226E-01	.227E-01	.228E-01	.231E-01		
$SIG$	=	.250E-03	.135E-03	.709E-04	.366E-04		
$1s^2 2s^2 S \rightarrow 1s^2 6f^2 F^0$ $E_0 = 97.90$ $E_1 = 9.46$ $E_{01} = 88.44$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.149E-01	.137E-01	.121E-01	.104E-01	.986E-02	.115E-01
$SIG$	=	.104E-02	.878E-03	.664E-03	.445E-03	.293E-03	.213E-03
$ABCDE$	=	.134E-01	-.914E-02	-.674E-03	.142E-01	.000E+00	
$X$	=	7.29	13.57	26.01	50.88		
$STR$	=	.127E-01	.129E-01	.129E-01	.130E-01		
$SIG$	=	.134E-03	.730E-04	.382E-04	.197E-04		
$1s^2 2s^2 S \rightarrow 1s^2 7f^2 F^0$ $E_0 = 97.90$ $E_1 = 6.94$ $E_{01} = 90.96$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.940E-02	.862E-02	.756E-02	.645E-02	.609E-02	.709E-02
$SIG$	=	.640E-03	.538E-03	.405E-03	.269E-03	.176E-03	.128E-03
$ABCDE$	=	.825E-02	-.571E-02	-.344E-03	.905E-02	.000E+00	
$X$	=	7.30	13.52	26.06	50.90		
$STR$	=	.784E-02	.793E-02	.797E-02	.804E-02		
$SIG$	=	.804E-04	.439E-04	.229E-04	.118E-04		
$1s^2 2s^2 S \rightarrow 1s^2 8f^2 F^0$ $E_0 = 97.90$ $E_1 = 5.31$ $E_{01} = 92.59$ (eV)							
$X$	=	1.10	1.20	1.39	1.79	2.58	4.16
$STR$	=	.632E-02	.576E-02	.504E-02	.430E-02	.404E-02	.470E-02
$SIG$	=	.422E-03	.353E-03	.266E-03	.176E-03	.115E-03	.830E-04
$ABCDE$	=	.544E-02	-.352E-02	-.956E-03	.664E-02	.000E+00	
$X$	=	7.30	13.50	26.03	50.87		
$STR$	=	.520E-02	.524E-02	.527E-02	.531E-02		
$SIG$	=	.524E-04	.285E-04	.149E-04	.766E-05		
$1s^2 2s^2 S \rightarrow 1s^2 9f^2 F^0$ $E_0 = 97.90$ $E_1 = 4.18$ $E_{01} = 93.71$ (eV)							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.443E-02	.402E-02	.353E-02	.300E-02	.281E-02	.326E-02
$SIG$	=	.293E-03	.244E-03	.183E-03	.121E-03	.790E-04	.568E-04
$ABCDE$	=	.378E-02	-.257E-02	-.202E-03	.427E-02	.000E+00	
$X$	=	7.30	13.55	26.04	50.90		
$STR$	=	.360E-02	.365E-02	.366E-02	.369E-02		
$SIG$	=	.358E-04	.195E-04	.102E-04	.526E-05		
$1s^2 4p^2 P^0 \rightarrow 1s^2 5d^2 D$ $E_0 = 21.63$ $E_1 = 13.61$ $E_{01} = 8.03$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.614E+01	.645E+01	.698E+01	.693E+01	.807E+01	.123E+02
$SIG$	=	.158E+01	.152E+01	.141E+01	.109E+01	.884E+00	.837E+00
$ABCDE$	=	-.272E+02	.249E+02	.454E+02	-.388E+02	.219E+02	
$X$	=	7.30	13.50	26.00	50.87		
$STR$	=	.199E+02	.321E+02	.456E+02	.596E+02		
$SIG$	=	.772E+00	.674E+00	.498E+00	.332E+00		

### 7.7 $N$ VI Direct Transitions

$1s^2 1S \rightarrow 1s 2s 1S$ $E_0 = 552.12$ $E_1 = 128.82$ $E_{01} = 423.30$ (eV)							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.107E-01	.111E-01	.120E-01	.133E-01	.148E-01	.162E-01
$SIG$	=	.312E-03	.297E-03	.275E-03	.237E-03	.185E-03	.125E-03
$ABCDE$	=	.194E-01	-.140E-01	.575E-02	-.105E-02	.000E+00	

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$X = 7.30 \quad 13.56 \quad 25.99 \quad 50.79$   
 $STR = .177E-01 \quad .185E-01 \quad .188E-01 \quad .190E-01$   
 $SIG = .780E-04 \quad .439E-04 \quad .233E-04 \quad .121E-04$

$1s^2 1S \rightarrow 1s3s^1S \quad E_0 = 552.12 \quad E_1 = 56.28 \quad E_{01} = 495.84 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.58 \quad 4.16$   
 $STR = .199E-02 \quad .210E-02 \quad .228E-02 \quad .257E-02 \quad .297E-02 \quad .327E-02$   
 $SIG = .497E-04 \quad .480E-04 \quad .447E-04 \quad .394E-04 \quad .315E-04 \quad .216E-04$   
 $ABCDE = .385E-02 \quad -.232E-02 \quad -.304E-03 \quad .669E-03 \quad .000E+00$   
 $X = 7.30 \quad 13.56 \quad 26.02 \quad 50.84$   
 $STR = .353E-02 \quad .368E-02 \quad .376E-02 \quad .380E-02$   
 $SIG = .133E-04 \quad .745E-05 \quad .397E-05 \quad .205E-05$

$1s^2 1S \rightarrow 1s4s^1S \quad E_0 = 552.12 \quad E_1 = 31.40 \quad E_{01} = 520.72 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.59 \quad 4.17$   
 $STR = .719E-03 \quad .767E-03 \quad .842E-03 \quad .956E-03 \quad .112E-02 \quad .122E-02$   
 $SIG = .171E-04 \quad .167E-04 \quad .157E-04 \quad .139E-04 \quad .113E-04 \quad .762E-05$   
 $ABCDE = .143E-02 \quad -.803E-03 \quad -.212E-03 \quad .261E-03 \quad .000E+00$   
 $X = 7.30 \quad 13.56 \quad 25.93 \quad 50.90$   
 $STR = .132E-02 \quad .138E-02 \quad .139E-02 \quad .141E-02$   
 $SIG = .472E-05 \quad .266E-05 \quad .140E-05 \quad .725E-06$

$1s^2 1S \rightarrow 1s2p^1P^0 \quad E_0 = 552.12 \quad E_1 = 122.60 \quad E_{01} = 429.52 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.58 \quad 4.17$   
 $STR = .281E-01 \quad .336E-01 \quad .442E-01 \quad .627E-01 \quad .918E-01 \quad .130E+00$   
 $SIG = .811E-03 \quad .888E-03 \quad .100E-02 \quad .111E-02 \quad .112E-02 \quad .988E-03$   
 $ABCDE = .397E-02 \quad -.318E-01 \quad .108E+00 \quad -.597E-01 \quad .906E-01$   
 $X = 7.29 \quad 13.55 \quad 26.08 \quad 50.75$   
 $STR = .181E+00 \quad .239E+00 \quad .300E+00 \quad .359E+00$   
 $SIG = .785E-03 \quad .559E-03 \quad .364E-03 \quad .224E-03$

$1s^2 1S \rightarrow 1s3p^1P^0 \quad E_0 = 552.12 \quad E_1 = 54.47 \quad E_{01} = 497.65 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .538E-02 \quad .658E-02 \quad .885E-02 \quad .130E-01 \quad .189E-01 \quad .269E-01$   
 $SIG = .134E-03 \quad .150E-03 \quad .173E-03 \quad .198E-03 \quad .199E-03 \quad .177E-03$   
 $ABCDE = .453E-02 \quad -.707E-02 \quad .111E-01 \quad -.467E-02 \quad .165E-01$   
 $X = 7.29 \quad 13.54 \quad 25.92 \quad 50.84$   
 $STR = .363E-01 \quad .472E-01 \quad .579E-01 \quad .692E-01$   
 $SIG = .136E-03 \quad .952E-04 \quad .611E-04 \quad .372E-04$

$1s^2 1S \rightarrow 1s4p^1P^0 \quad E_0 = 552.12 \quad E_1 = 30.66 \quad E_{01} = 521.46 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .197E-02 \quad .242E-02 \quad .329E-02 \quad .484E-02 \quad .745E-02 \quad .100E-01$   
 $SIG = .467E-04 \quad .527E-04 \quad .615E-04 \quad .704E-04 \quad .750E-04 \quad .629E-04$   
 $ABCDE = .192E-02 \quad -.118E-02 \quad .224E-03 \quad .449E-03 \quad .597E-02$   
 $X = 7.28 \quad 13.55 \quad 26.07 \quad 50.80$   
 $STR = .135E-01 \quad .175E-01 \quad .214E-01 \quad .254E-01$   
 $SIG = .482E-04 \quad .336E-04 \quad .215E-04 \quad .130E-04$

$1s^2 1S \rightarrow 1s5p^1P^0 \quad E_0 = 552.12 \quad E_1 = 19.69 \quad E_{01} = 532.43 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.59 \quad 4.15$   
 $STR = .958E-03 \quad .119E-02 \quad .163E-02 \quad .237E-02 \quad .345E-02 \quad .490E-02$   
 $SIG = .222E-04 \quad .253E-04 \quad .298E-04 \quad .338E-04 \quad .340E-04 \quad .301E-04$   
 $ABCDE = .141E-02 \quad -.278E-02 \quad .383E-02 \quad -.183E-02 \quad .277E-02$   
 $X = 7.29 \quad 13.54 \quad 26.11 \quad 50.90$   
 $STR = .657E-02 \quad .842E-02 \quad .104E-01 \quad .123E-01$   
 $SIG = .230E-04 \quad .159E-04 \quad .102E-04 \quad .617E-05$

$1s^2 1S \rightarrow 1s6p^1 P^0 \quad E_0 = 552.12 \quad E_1 = 13.62 \quad E_{01} = 538.50 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.525E-03	.654E-03	.895E-03	.132E-02	.188E-02	.274E-02
$SIG$	=	.121E-04	.138E-04	.162E-04	.186E-04	.184E-04	.166E-04
$ABCDE$	=	.793E-03	-.163E-02	.223E-02	-.103E-02	.155E-02	
$X$	=	7.30	13.56	26.01	50.90		
$STR$	=	.366E-02	.473E-02	.576E-02	.684E-02		
$SIG$	=	.127E-04	.881E-05	.560E-05	.340E-05		
$1s^2 1S \rightarrow 1s7p^1 P^0 \quad E_0 = 552.12 \quad E_1 = 9.99 \quad E_{01} = 542.13 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.15
$STR$	=	.325E-03	.401E-03	.557E-03	.816E-03	.122E-02	.169E-02
$SIG$	=	.742E-05	.839E-05	.100E-04	.114E-04	.119E-04	.102E-04
$ABCDE$	=	.447E-03	-.619E-03	.625E-03	-.230E-03	.963E-03	
$X$	=	7.30	13.56	26.00	50.90		
$STR$	=	.227E-02	.293E-02	.357E-02	.423E-02		
$SIG$	=	.779E-05	.542E-05	.344E-05	.208E-05		
$1s^2 1S \rightarrow 1s3d^1 P^0 \quad E_0 = 552.12 \quad E_1 = 54.52 \quad E_{01} = 497.60 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.242E-03	.320E-03	.481E-03	.765E-03	.112E-02	.152E-02
$SIG$	=	.603E-05	.730E-05	.940E-05	.117E-04	.118E-04	.997E-05
$ABCDE$	=	.236E-02	-.369E-02	.136E-02	.161E-03	.000E+00	
$X$	=	7.29	13.54	25.92	50.84		
$STR$	=	.191E-02	.214E-02	.222E-02	.227E-02		
$SIG$	=	.716E-05	.432E-05	.235E-05	.122E-05		
$1s2s^3 S \rightarrow 1s2p^3 P^0 \quad E_0 = 132.30 \quad E_1 = 125.74 \quad E_{01} = 6.56 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.867E+01	.871E+01	.872E+01	.910E+01	.956E+01	.951E+01
$SIG$	=	.547E+01	.504E+01	.433E+01	.353E+01	.257E+01	.159E+01
$ABCDE$	=	-.315E+01	.284E+02	-.267E+02	.996E+01	.508E+01	
$X$	=	7.30	13.54	26.02	50.81		
$STR$	=	.100E+02	.120E+02	.148E+02	.176E+02		
$SIG$	=	.951E+00	.616E+00	.394E+00	.240E+00		
$1s2s^3 S \rightarrow 1s3p^3 P^0 \quad E_0 = 132.30 \quad E_1 = 55.40 \quad E_{01} = 76.90 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.171E+00	.191E+00	.229E+00	.296E+00	.417E+00	.597E+00
$SIG$	=	.918E-02	.938E-02	.961E-02	.972E-02	.951E-02	.847E-02
$ABCDE$	=	-.702E+00	.945E+00	.410E+00	-.534E+00	.743E+00	
$X$	=	7.30	13.52	26.01	50.84		
$STR$	=	.888E+00	.130E+01	.178E+01	.225E+01		
$SIG$	=	.718E-02	.568E-02	.403E-02	.261E-02		
$1s2s^3 S \rightarrow 1s4p^3 P^0 \quad E_0 = 132.30 \quad E_1 = 31.01 \quad E_{01} = 101.29 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.462E-01	.511E-01	.605E-01	.785E-01	.108E+00	.151E+00
$SIG$	=	.189E-02	.190E-02	.193E-02	.196E-02	.188E-02	.162E-02
$ABCDE$	=	-.105E+00	.168E+00	.443E-01	-.706E-01	.151E+00	
$X$	=	7.30	13.52	25.96	50.84		
$STR$	=	.213E+00	.298E+00	.396E+00	.492E+00		
$SIG$	=	.131E-02	.988E-03	.684E-03	.433E-03		
$1s2s^3 S \rightarrow 1s5p^3 P^0 \quad E_0 = 132.30 \quad E_1 = 19.79 \quad E_{01} = 112.51 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.202E-01	.219E-01	.252E-01	.326E-01	.451E-01	.622E-01
$SIG$	=	.740E-03	.734E-03	.728E-03	.731E-03	.704E-03	.603E-03
$ABCDE$	=	-.271E-01	.285E-01	.598E-01	-.452E-01	.561E-01	

<i>X</i>	=	7.30	13.52	26.05	50.86		
<i>STR</i>	=	.872E-01	.122E+00	.159E+00	.195E+00		
<i>SIG</i>	=	.481E-03	.363E-03	.245E-03	.154E-03		
<i>1s2s<sup>3</sup>S</i> → <i>1s3d<sup>3</sup>D</i> <i>E</i> <sub>0</sub> = 132.30 <i>E</i> <sub>1</sub> = 54.47 <i>E</i> <sub>01</sub> = 77.83 (eV)							
<i>X</i>	=	1.10	1.20	1.40	1.80	2.58	4.16
<i>STR</i>	=	.506E+00	.524E+00	.555E+00	.596E+00	.641E+00	.742E+00
<i>SIG</i>	=	.231E-01	.193E-01	.145E-01	.104E-01		
<i>ABCDE</i>	=	.116E+01	-.230E+01	.309E+01	-.149E+01	.000E+00	
<i>X</i>	=	7.30	13.49	25.95	50.88		
<i>STR</i>	=	.915E+00	.104E+01	.109E+01	.111E+01		
<i>SIG</i>	=	.731E-02	.451E-02	.245E-02	.127E-02		
<i>1s2s<sup>3</sup>S</i> → <i>1s4d<sup>3</sup>D</i> <i>E</i> <sub>0</sub> = 132.30 <i>E</i> <sub>1</sub> = 30.61 <i>E</i> <sub>01</sub> = 101.69 (eV)							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.59	4.16
<i>STR</i>	=	.958E-01	.973E-01	.100E+00	.105E+00	.112E+00	.123E+00
<i>SIG</i>	=	.388E-02	.362E-02	.320E-02	.262E-02	.193E-02	.131E-02
<i>ABCDE</i>	=	.177E+00	-.292E+00	.393E+00	-.188E+00	.000E+00	
<i>X</i>	=	7.30	13.57	25.96	50.84		
<i>STR</i>	=	.143E+00	.163E+00	.168E+00	.170E+00		
<i>SIG</i>	=	.874E-03	.537E-03	.289E-03	.149E-03		
<i>1s2s<sup>3</sup>S</i> → <i>1s5d<sup>3</sup>D</i> <i>E</i> <sub>0</sub> = 132.30 <i>E</i> <sub>1</sub> = 19.59 <i>E</i> <sub>01</sub> = 112.71 (eV)							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.58	4.16
<i>STR</i>	=	.363E-01	.365E-01	.372E-01	.383E-01	.403E-01	.434E-01
<i>SIG</i>	=	.133E-02	.123E-02	.107E-02	.860E-03	.628E-03	.420E-03
<i>ABCDE</i>	=	.608E-01	-.942E-01	.129E+00	-.607E-01	.000E+00	
<i>X</i>	=	7.30	13.58	26.01	50.86		
<i>STR</i>	=	.500E-01	.566E-01	.583E-01	.585E-01		
<i>SIG</i>	=	.276E-03	.168E-03	.903E-04	.463E-04		
<i>1s2s<sup>3</sup>S</i> → <i>1s4f<sup>3</sup>F<sup>0</sup></i> <i>E</i> <sub>0</sub> = 132.30 <i>E</i> <sub>1</sub> = 30.61 <i>E</i> <sub>01</sub> = 101.69 (eV)							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.59	4.16
<i>STR</i>	=	.481E-01	.465E-01	.441E-01	.414E-01	.438E-01	.549E-01
<i>SIG</i>	=	.195E-02	.173E-02	.141E-02	.103E-02	.755E-03	.588E-03
<i>ABCDE</i>	=	.641E-01	-.365E-01	-.484E-01	.782E-01	.000E+00	
<i>X</i>	=	7.30	13.57	25.96	50.84		
<i>STR</i>	=	.611E-01	.620E-01	.620E-01	.626E-01		
<i>SIG</i>	=	.374E-03	.204E-03	.106E-03	.549E-04		
<i>1s2s<sup>3</sup>S</i> → <i>1s5f<sup>3</sup>F<sup>0</sup></i> <i>E</i> <sub>0</sub> = 132.30 <i>E</i> <sub>1</sub> = 19.59 <i>E</i> <sub>01</sub> = 112.71 (eV)							
<i>X</i>	=	1.10	1.20	1.40	1.79	2.58	4.16
<i>STR</i>	=	.256E-01	.245E-01	.233E-01	.216E-01	.223E-01	.275E-01
<i>SIG</i>	=	.938E-03	.824E-03	.668E-03	.485E-03	.347E-03	.266E-03
<i>ABCDE</i>	=	.324E-01	-.206E-01	-.153E-01	.337E-01	.000E+00	
<i>X</i>	=	7.29	13.58	26.00	50.84		
<i>STR</i>	=	.308E-01	.313E-01	.312E-01	.315E-01		
<i>SIG</i>	=	.170E-03	.926E-04	.483E-04	.249E-04		

7.8 *N VI Exchange Transitions*

<i>1s<sup>2</sup>1S</i> → <i>1s2s<sup>3</sup>S</i> <i>E</i> <sub>0</sub> = 552.12 <i>E</i> <sub>1</sub> = 128.82 <i>E</i> <sub>01</sub> = 423.30 (eV)							
<i>X</i>	=	1.11	1.18	1.29	1.50	1.83	2.39
<i>STR</i>	=	.398E-02	.388E-02	.368E-02	.332E-02	.274E-02	.196E-02
<i>SIG</i>	=	.116E-03	.106E-03	.913E-04	.713E-04	.480E-04	.264E-04
<i>ABCDE</i>	=	.383E+04	-.276E+04	-.112E+04	.139E+04	.000E+00	

$X$	=	3.33	4.91	7.58	12.02		
$STR$	=	.116E-02	.699E-03	.325E-03	.126E-03		
$SIG$	=	.112E-04	.457E-05	.138E-05	.336E-06		
$1s^2 1S \rightarrow 1s3s^3S \quad E_0 = 552.12 \quad E_1 = 56.28 \quad E_{01} = 495.84 \text{ (eV)}$							
$X$	=	1.11	1.18	1.30	1.49	1.83	2.40
$STR$	=	.108E-02	.105E-02	.972E-03	.857E-03	.680E-03	.461E-03
$SIG$	=	.269E-04	.244E-04	.206E-04	.157E-04	.102E-04	.527E-05
$ABCDE$	=	.976E+03	-.328E+03	-.946E+03	.673E+03	.000E+00	
$X$	=	3.33	4.92	7.59	12.04		
$STR$	=	.250E-03	.153E-03	.672E-04	.242E-04		
$SIG$	=	.206E-05	.852E-06	.243E-06	.551E-07		
$1s^2 1S \rightarrow 1s4s^3S \quad E_0 = 552.12 \quad E_1 = 31.40 \quad E_{01} = 520.72 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.49	1.83	2.40
$STR$	=	.440E-03	.421E-03	.394E-03	.344E-03	.268E-03	.181E-03
$SIG$	=	.104E-04	.936E-05	.795E-05	.602E-05	.383E-05	.197E-05
$ABCDE$	=	.390E+03	-.853E+02	-.448E+03	.296E+03	.000E+00	
$X$	=	3.34	4.92	7.59	12.04		
$STR$	=	.940E-04	.579E-04	.252E-04	.885E-05		
$SIG$	=	.735E-06	.308E-06	.868E-07	.192E-07		
$1s^2 1S \rightarrow 1s2p^3P^0 \quad E_0 = 552.12 \quad E_1 = 125.74 \quad E_{01} = 426.38 \text{ (eV)}$							
$X$	=	1.10	1.17	1.29	1.49	1.83	2.39
$STR$	=	.276E-01	.253E-01	.221E-01	.177E-01	.125E-01	.757E-02
$SIG$	=	.796E-03	.687E-03	.545E-03	.377E-03	.219E-03	.101E-03
$ABCDE$	=	.491E+04	.224E+05	-.300E+05	.124E+05	.000E+00	
$X$	=	3.33	4.93	7.58	12.03		
$STR$	=	.362E-02	.180E-02	.687E-03	.223E-03		
$SIG$	=	.347E-04	.117E-04	.289E-05	.590E-06		
$1s^2 1S \rightarrow 1s3p^3P^0 \quad E_0 = 552.12 \quad E_1 = 55.40 \quad E_{01} = 496.72 \text{ (eV)}$							
$X$	=	1.11	1.18	1.29	1.50	1.83	2.40
$STR$	=	.157E-01	.165E-01	.177E-01	.199E-01	.236E-01	.291E-01
$SIG$	=	.129E-03	.128E-03	.125E-03	.122E-03	.118E-03	.111E-03
$ABCDE$	=	-.238E-02	.211E-01	-.140E-01	.104E-01	.282E-01	
$X$	=	3.34	4.91	7.57	12.04		
$STR$	=	.373E-01	.462E-01	.570E-01	.695E-01		
$SIG$	=	.102E-03	.860E-04	.687E-04	.527E-04		
$1s^2 1S \rightarrow 1s4p^3P^0 \quad E_0 = 552.12 \quad E_1 = 31.01 \quad E_{01} = 521.12 \text{ (eV)}$							
$X$	=	1.11	1.18	1.30	1.49	1.83	2.40
$STR$	=	.596E-02	.619E-02	.663E-02	.748E-02	.886E-02	.111E-01
$SIG$	=	.470E-04	.458E-04	.445E-04	.436E-04	.421E-04	.401E-04
$ABCDE$	=	-.319E-02	.164E-01	-.167E-01	.940E-02	.110E-01	
$X$	=	3.34	4.91	7.58	12.03		
$STR$	=	.136E-01	.169E-01	.209E-01	.253E-01		
$SIG$	=	.355E-04	.300E-04	.240E-04	.183E-04		
$1s^2 1S \rightarrow 1s5p^3P^0 \quad E_0 = 552.12 \quad E_1 = 19.79 \quad E_{01} = 532.33 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.39
$STR$	=	.290E-02	.301E-02	.323E-02	.362E-02	.425E-02	.523E-02
$SIG$	=	.224E-04	.218E-04	.213E-04	.206E-04	.198E-04	.187E-04
$ABCDE$	=	.329E-03	.262E-02	-.206E-02	.192E-02	.465E-02	
$X$	=	3.34	4.92	7.57	12.04		
$STR$	=	.666E-02	.818E-02	.100E-01	.121E-01		
$SIG$	=	.170E-04	.142E-04	.113E-04	.857E-05		

$1s^2\ ^1S \rightarrow 1s6p\ ^3P^0$ $E_0 = 552.12$ $E_1 = 13.71$ $E_{01} = 538.41$ (eV)							
X	=	1.11	1.18	1.29	1.50	1.83	2.40
STR	=	.163E-02	.169E-02	.181E-02	.203E-02	.239E-02	.289E-02
SIG	=	.124E-04	.121E-04	.118E-04	.114E-04	.110E-04	.102E-04
ABCDE	=	-.293E-04	.196E-02	-.160E-02	.126E-02	.267E-02	
X	=	3.34	4.92	7.58	12.04		
STR	=	.373E-02	.457E-02	.559E-02	.679E-02		
SIG	=	.941E-05	.782E-05	.621E-05	.475E-05		
$1s^2\ ^1S \rightarrow 1s7p\ ^3P^0$ $E_0 = 552.12$ $E_1 = 10.09$ $E_{01} = 542.03$ (eV)							
X	=	1.10	1.17	1.29	1.49	1.83	2.40
STR	=	.102E-02	.105E-02	.112E-02	.125E-02	.146E-02	.187E-02
SIG	=	.770E-05	.749E-05	.726E-05	.697E-05	.670E-05	.652E-05
ABCDE	=	-.359E-03	.255E-02	-.297E-02	.181E-02	.173E-02	
X	=	3.34	4.92	7.58	12.02		
STR	=	.225E-02	.281E-02	.345E-02	.414E-02		
SIG	=	.565E-05	.478E-05	.380E-05	.288E-05		
$1s^2\ ^1S \rightarrow 1s8p\ ^3P^0$ $E_0 = 552.12$ $E_1 = 7.69$ $E_{01} = 544.43$ (eV)							
X	=	1.10	1.18	1.29	1.49	1.83	2.39
STR	=	.659E-03	.684E-03	.734E-03	.819E-03	.969E-03	.117E-02
SIG	=	.497E-05	.484E-05	.472E-05	.456E-05	.441E-05	.410E-05
ABCDE	=	.984E-04	.371E-03	-.673E-04	.236E-03	.107E-02	
X	=	3.34	4.92	7.58	12.03		
STR	=	.153E-02	.188E-02	.231E-02	.280E-02		
SIG	=	.381E-05	.317E-05	.254E-05	.194E-05		
$1s^2\ ^1S \rightarrow 1s9p\ ^3P^0$ $E_0 = 552.12$ $E_1 = 6.07$ $E_{01} = 546.05$ (eV)							
X	=	1.10	1.18	1.29	1.49	1.83	2.40
STR	=	.467E-03	.486E-03	.517E-03	.578E-03	.678E-03	.819E-03
SIG	=	.351E-05	.344E-05	.332E-05	.321E-05	.308E-05	.283E-05
ABCDE	=	.118E-03	.333E-03	-.338E-03	.347E-03	.701E-03	
X	=	3.33	4.93	7.58	12.03		
STR	=	.107E-02	.129E-02	.157E-02	.189E-02		
SIG	=	.266E-05	.217E-05	.172E-05	.131E-05		
$1s^2\ ^1S \rightarrow 1s3d\ ^3D$ $E_0 = 552.12$ $E_1 = 54.47$ $E_{01} = 497.65$ (eV)							
X	=	1.11	1.18	1.29	1.50	1.83	2.39
STR	=	.153E-02	.132E-02	.105E-02	.734E-03	.429E-03	.203E-03
SIG	=	.380E-04	.308E-04	.221E-04	.134E-04	.641E-05	.233E-05
ABCDE	=	.242E+02	.759E+03	-.744E+02	-.120E+03	.000E+00	
X	=	3.34	4.92	7.58	12.04		
STR	=	.758E-04	.313E-04	.908E-05	.201E-05		
SIG	=	.622E-06	.174E-06	.328E-07	.456E-08		
$1s^2\ ^1S \rightarrow 1s4d\ ^3D$ $E_0 = 552.12$ $E_1 = 30.61$ $E_{01} = 521.51$ (eV)							
X	=	1.10	1.18	1.29	1.50	1.83	2.40
STR	=	.789E-03	.683E-03	.536E-03	.370E-03	.216E-03	.102E-03
SIG	=	.186E-04	.152E-04	.108E-04	.646E-05	.308E-05	.111E-05
ABCDE	=	.122E+02	.401E+03	-.381E+02	-.711E+02	.000E+00	
X	=	3.34	4.93	7.57	12.04		
STR	=	.366E-04	.153E-04	.440E-05	.951E-06		
SIG	=	.286E-06	.813E-07	.152E-07	.206E-08		
$1s^2\ ^1S \rightarrow 1s4d\ ^3D$ $E_0 = 552.12$ $E_1 = 55.40$ $E_{01} = 70.48$ (eV)							
X	=	1.10	1.18	1.29	1.49	1.83	2.40
STR	=	.218E-01	.204E-01	.183E-01	.153E-01	.116E-01	.795E-02
SIG	=	.382E-02	.334E-02	.273E-02	.198E-02	.123E-02	.640E-03
ABCDE	=	.312E+03	.544E+03	-.100E+04	.552E+03	.000E+00	

$X$	=	3.34	4.93	7.58	12.04		
$STR$	=	.470E-02	.243E-02	.108E-02	.418E-03		
$SIG$	=	.272E-03	.953E-04	.275E-04	.671E-05		
$1s^2 1S \rightarrow 1s4s^3S \quad E_0 = 552.12 \quad E_1 = 31.05 \quad E_{01} = 94.83 \text{ (eV)}$							
$X$	=	1.11	1.17	1.30	1.50	1.83	2.39
$STR$	=	.784E-02	.710E-02	.618E-02	.493E-02	.352E-02	.220E-02
$SIG$	=	.102E-02	.870E-03	.684E-03	.472E-03	.275E-03	.132E-03
$ABCDE$	=	.963E+02	.295E+03	-.513E+03	.274E+03	.000E+00	
$X$	=	3.33	4.92	7.58	12.02		
$STR$	=	.120E-02	.572E-03	.232E-03	.823E-04		
$SIG$	=	.516E-04	.167E-04	.440E-05	.983E-06		
$1s^2 1S \rightarrow 1s3p^3P^0 \quad E_0 = 125.88 \quad E_1 = 55.40 \quad E_{01} = 70.48 \text{ (eV)}$							
$X$	=	1.10	1.18	1.30	1.49	1.83	2.40
$STR$	=	.304E+00	.321E+00	.355E+00	.411E+00	.508E+00	.627E+00
$SIG$	=	.177E-01	.175E-01	.176E-01	.178E-01	.178E-01	
$ABCDE$	=	-.208E+01	.529E+01	-.497E+01	.206E+01	.140E+01	
$X$	=	3.33	4.92	7.58	12.03		
$STR$	=	.809E+00	.103E+01	.137E+01	.180E+01		
$SIG$	=	.168E-01	.156E-01	.135E-01	.116E-01	.965E-02	
$1s^2 1S \rightarrow 1s4p^3P^0 \quad E_0 = 125.88 \quad E_1 = 31.01 \quad E_{01} = 94.88 \text{ (eV)}$							
$X$	=	1.11	1.17	1.30	1.50	1.83	2.39
$STR$	=	.721E-01	.755E-01	.840E-01	.951E-01	.117E+00	.146E+00
$SIG$	=	.312E-02	.309E-02	.310E-02	.304E-02	.304E-02	.292E-02
$ABCDE$	=	-.342E+00	.950E+00	-.960E+00	.426E+00	.260E+00	
$X$	=	3.34	4.92	7.58	12.02		
$STR$	=	.183E+00	.230E+00	.294E+00	.378E+00		
$SIG$	=	.261E-02	.223E-02	.186E-02	.151E-02		
$1s^2 1S \rightarrow 1s5p^3P^0 \quad E_0 = 125.88 \quad E_1 = 19.79 \quad E_{01} = 106.09 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.40
$STR$	=	.296E-01	.315E-01	.338E-01	.392E-01	.472E-01	.587E-01
$SIG$	=	.115E-02	.114E-02	.112E-02	.112E-02	.110E-02	.105E-02
$ABCDE$	=	-.117E+00	.335E+00	-.337E+00	.150E+00	.962E-01	
$X$	=	3.34	4.92	7.58	12.07		
$STR$	=	.730E-01	.914E-01	.116E+00	.148E+00		
$SIG$	=	.935E-03	.794E-03	.654E-03	.524E-03		
$1s^2 1S \rightarrow 1s3d^3D \quad E_0 = 125.88 \quad E_1 = 54.47 \quad E_{01} = 71.42 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.50	1.84	2.40
$STR$	=	.149E+00	.139E+00	.125E+00	.105E+00	.800E-01	.534E-01
$SIG$	=	.257E-01	.226E-01	.184E-01	.133E-01	.831E-02	.425E-02
$ABCDE$	=	.780E+03	.108E+05	-.184E+05	.964E+04	.000E+00	
$X$	=	3.33	4.92	7.58	12.04		
$STR$	=	.306E-01	.146E-01	.571E-02	.172E-02		
$SIG$	=	.175E-02	.566E-03	.144E-03	.272E-04		
$1s^2 s^1S \rightarrow 1s4d^3D \quad E_0 = 125.88 \quad E_1 = 30.61 \quad E_{01} = 95.27 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.49	1.83	2.39
$STR$	=	.414E-01	.385E-01	.339E-01	.278E-01	.203E-01	.128E-01
$SIG$	=	.537E-02	.468E-02	.375E-02	.266E-02	.159E-02	.766E-03
$ABCDE$	=	.209E+03	.386E+04	-.683E+04	.361E+04	.000E+00	
$X$	=	3.34	4.93	7.58	12.08		
$STR$	=	.690E-02	.313E-02	.115E-02	.311E-03		
$SIG$	=	.295E-03	.909E-04	.216E-04	.368E-05		

$1s^2s^1S \rightarrow 1s4d^3D \quad E_0 = 125.88 \quad E_1 = 19.59 \quad E_{01} = 106.29 \text{ (eV)}$							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.184E-01	.171E-01	.ISOE-01	.121E-01	.863E-02	.532E-02
$SIG$	=	.214E-02	.186E-02	.148E-02	.103E-02	.605E-03	.285E-03
$ABCDE$	=	.897E+02	.181E+04	-.315E+04	.162E+04	.000E+00	
$X$	=	3.34	4.92	7.58	12.05		
$STR$	=	.279E-02	.123E-02	.438E-03	.115E-03		
$SIG$	=	.107E-03	.319E-04	.741E-05	.123E-05		
$1s^2s^1S \rightarrow 1s4f^3F^0 \quad E_0 = 125.88 \quad E_1 = 30.61 \quad E_{01} = 95.27 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.49	1.83	2.39
$STR$	=	.329E-01	.292E-01	.241E-01	.179E-01	.116E-01	.626E-02
$SIG$	=	.426E-02	.355E-02	.266E-02	.171E-02	.906E-03	.374E-03
$ABCDE$	=	-.771E+02	.180E+04	-.180E+04	.708E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.07		
$STR$	=	.267E-02	.866E-03	.216E-03	.487E-04		
$SIG$	=	.114E-03	.251E-04	.407E-05	.576E-06		
$1s^2s^1S \rightarrow 1s5f^3F^0 \quad E_0 = 125.88 \quad E_1 = 19.59 \quad E_{01} = 106.29 \text{ (eV)}$							
$X$	=	1.10	1.18	1.30	1.50	1.83	2.39
$STR$	=	.186E-01	.165E-01	.136E-01	.100E-01	.639E-02	.339E-02
$SIG$	=	.216E-02	.179E-02	.134E-02	.855E-03	.446E-03	.182E-03
$ABCDE$	=	-.464E+02	.109E+04	-.106E+04	.363E+03	.000E+00	
$X$	=	3.34	4.92	7.57	12.04		
$STR$	=	.143E-02	.454E-03	.110E-03	.246E-04		
$SIG$	=	.549E-04	.118E-04	.186E-05	.262E-06		
$1s^2s^1S \rightarrow 1s6f^3F^0 \quad E_0 = 125.88 \quad E_1 = 13.62 \quad E_{01} = 112.27 \text{ (eV)}$							
$X$	=	1.10	1.18	1.29	1.50	1.83	2.40
$STR$	=	.110E-01	.971E-02	.792E-02	.583E-02	.368E-02	.195E-02
$SIG$	=	.120E-02	.100E-02	.743E-03	.472E-03	.244E-03	.986E-04
$ABCDE$	=	-.315E+02	.709E+03	-.759E+03	.295E+03	.000E+00	
$X$	=	3.34	4.92	7.58	12.03		
$STR$	=	.817E-03	.255E-03	.615E-04	.137E-04		
$SIG$	=	.296E-04	.630E-05	.984E-06	.138E-06		

## 7.9 N VII Direct Transitions

$1s^2S \rightarrow 2s^2S \quad E_0 = 667.43 \quad E_1 = 166.87 \quad E_{01} = 500.55 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.141E-01	.143E-01	.146E-01	.150E-01	.155E-01	.162E-01
$SIG$	=	.174E-03	.162E-03	.142E-03	.113E-03	.819E-04	.529E-04
$ABCDE$	=	.179E-01	-.916E-02	.936E-02	-.435E-02	.000E+00	
$X$	=	7.29	13.54	25.97	50.94		
$STR$	=	.168E-01	.174E-01	.175E-01	.178E-01		
$SIG$	=	.314E-04	.174E-04	.914E-05	.475E-05		
$1s^2S \rightarrow 3s^2S \quad E_0 = 667.43 \quad E_1 = 74.14 \quad E_{01} = 593.29 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.298E-02	.299E-02	.304E-02	.304E-02	.310E-02	.321E-02
$SIG$	=	.310E-04	.286E-04	.249E-04	.195E-04	.138E-04	.884E-05
$ABCDE$	=	.355E-02	-.197E-02	.260E-02	-.123E-02	.000E+00	
$RAT$	=	1.00	1.00	1.01	1.00	1.00	1.00
$X$	=	7.30	13.55	25.96	50.90		
$STR$	=	.334E-02	.344E-02	.347E-02	.351E-02		
$SIG$	=	.525E-05	.291E-05	.153E-05	.792E-06		
$RAT$	=	1.00	1.00	1.00	1.00		



$1s^2S \rightarrow 4s^2S \quad E_0 = 667.43 \quad E_1 = 41.67 \quad E_{01} = 625.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.113E-02	.114E-02	.114E-02	.113E-02	.116E-02	.121E-02
$SIG$	=	.112E-04	.103E-04	.885E-05	.688E-05	.487E-05	.316E-05
$ABCDE$	=	.132E-02	-.578E-03	.559E-03	-.157E-03	.000E+00	
$X$	=	7.30	13.55	26.05	50.82		
$STR$	=	.126E-02	.128E-02	.129E-02	.130E-02		
$SIG$	=	.187E-05	.103E-05	.538E-06	.278E-06		
$1s^2S \rightarrow 5s^2S \quad E_0 = 667.43 \quad E_1 = 26.67 \quad E_{01} = 640.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.553E-03	.552E-03	.555E-03	.558E-03	.567E-03	.578E-03
$SIG$	=	.534E-05	.489E-05	.421E-05	.330E-05	.232E-05	.148E-05
$ABCDE$	=	.637E-03	-.316E-03	.411E-03	-.183E-03	.000E+00	
$X$	=	7.30	13.55	26.06	50.88		
$STR$	=	.605E-03	.615E-03	.628E-03	.629E-03		
$SIG$	=	.880E-06	.482E-06	.256E-06	.131E-06		
$1s^2S \rightarrow 6s^2S \quad E_0 = 667.43 \quad E_1 = 18.53 \quad E_{01} = 648.89 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.312E-03	.312E-03	.312E-03	.312E-03	.319E-03	.324E-03
$SIG$	=	.297E-05	.273E-05	.234E-05	.183E-05	.129E-05	.815E-06
$ABCDE$	=	.359E-03	-.192E-03	.261E-03	-.117E-03	.000E+00	
$X$	=	7.29	13.55	26.04	50.86		
$STR$	=	.339E-03	.349E-03	.351E-03	.356E-03		
$SIG$	=	.487E-06	.270E-06	.141E-06	.733E-07		
$1s^2S \rightarrow 9s^2S \quad E_0 = 667.43 \quad E_1 = 8.20 \quad E_{01} = 659.23 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.900E-04	.894E-04	.899E-04	.888E-04	.889E-04	.943E-04
$SIG$	=	.844E-06	.769E-06	.663E-06	.512E-06	.356E-06	.234E-06
$ABCDE$	=	.103E-03	-.523E-04	.615E-04	-.209E-04	.000E+00	
$X$	=	7.30	13.55	25.94	50.82		
$STR$	=	.967E-04	.996E-04	.100E-03	.101E-03		
$SIG$	=	.137E-06	.758E-07	.399E-07	.205E-07		
$1s^2S \rightarrow 2p^2P \quad E_0 = 667.43 \quad E_1 = 166.74 \quad E_{01} = 500.69 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.15
$STR$	=	.590E-01	.620E-01	.678E-01	.806E-01	.104E+00	.141E+00
$SIG$	=	.729E-03	.702E-03	.659E-03	.610E-03	.549E-03	.463E-03
$ABCDE$	=	.174E-03	.540E-02	.987E-01	-.490E-01	.944E-01	
$X$	=	7.29	13.54	25.96	50.93		
$STR$	=	.189E+00	.247E+00	.308E+00	.373E+00		
$SIG$	=	.352E-03	.248E-03	.1e1E-03	.995E-04		
$1s^2S \rightarrow 3p^2P \quad E_0 = 667.43 \quad E_1 = 74.14 \quad E_{01} = 593.29 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.126E-01	.128E-01	.137E-01	.157E-01	.198E-01	.264E-01
$SIG$	=	.131E-03	.122E-03	.112E-03	.101E-03	.880E-04	.727E-04
$ABCDE$	=	.484E-02	-.572E-02	.206E-01	-.749E-02	.153E-01	
$X$	=	7.30	13.55	25.95	50.90		
$STR$	=	.346E-01	.444E-01	.544E-01	.649E-01		
$SIG$	=	.544E-04	.376E-04	.240E-04	.146E-04		
$1s^2S \rightarrow 4p^2P \quad E_0 = 667.43 \quad E_1 = 41.67 \quad E_{01} = 625.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.480E-02	.486E-02	.513E-02	.580E-02	.727E-02	.979E-02
$SIG$	=	.474E-04	.441E-04	.399E-04	.352E-04	.305E-04	.256E-04
$ABCDE$	=	.253E-02	-.305E-02	.726E-02	-.195E-02	.525E-02	

$X$	=	7.30	13.55	26.05	50.82		
$STR$	=	.126E-01	.160E-01	.196E-01	.232E-01		
$SIG$	=	.187E-04	.128E-04	.816E-05	.496E-05		
$1s^2S \rightarrow 5p^2P \quad E_0 = 667.43 \quad E_1 = 26.67 \quad E_{01} = 640.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.234E-02	.236E-02	.248E-02	.282E-02	.357E-02	.465E-02
$SIG$	=	.226E-04	.209E-04	.188E-04	.167E-04	.146E-04	.119E-04
$ABCDE$	=	.131E-02	-.158E-02	.365E-02	-.105E-02	.247E-02	
$X$	=	7.30	13.55	26.06	50.88		
$STR$	=	.599E-02	.766E-02	.933E-02	.110E-01		
$SIG$	=	.871E-05	.600E-05	.380E-05	.229E-05		
$1s^2S \rightarrow 6p^2P \quad E_0 = 667.43 \quad E_1 = 18.53 \quad E_{01} = 648.89 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.133E-02	.133E-02	.139E-02	.158E-02	.200E-02	.258E-02
$SIG$	=	.126E-04	.177E-04	.104E-04	.927E-05	.811E-05	.650E-05
$ABCDE$	=	.749E-03	-.904E-03	.208E-02	-.611E-03	.137E-02	
$X$	=	7.29	13.55	26.04	50.86		
$STR$	=	.335E-02	.426E-02	.518E-02	.612E-02		
$SIG$	=	.482E-05	.329E-05	.209E-05	.126E-05		
$1s^2S \rightarrow 9p^2P \quad E_0 = 667.43 \quad E_1 = 8.20 \quad E_{01} = 659.23 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.381E-03	.383E-03	.399E-03	.446E-03	.554E-03	.746E-03
$SIG$	=	.358E-05	.329E-05	.224E-05	.257E-05	.222E-05	.185E-05
$ABCDE$	=	.224E-03	-.238E-03	.465E-03	-.614E-04	.381E-03	
$X$	=	7.30	13.55	25.94	50.82		
$STR$	=	.951E-03	.120E-02	.146E-02	.172E-02		
$SIG$	=	.134E-05	.917E-06	.579E-06	.349E-06		
$1s^2S \rightarrow 3d^2D \quad E_0 = 667.43 \quad E_1 = 74.07 \quad E_{01} = 593.36 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.211E-02	.186E-02	.159E-02	.144E-02	.153E-02	.191E-02
$SIG$	=	.219E-04	.178E-04	.131E-04	.925E-05	.682E-05	.525E-05
$ABCDE$	=	.282E-02	-.459E-02	.310E-02	-.121E-02	.000E+00	
$X$	=	7.30	13.55	25.95	50.90		
$STR$	=	.229E-02	.255E-02	.266E-02	.272E-02		
$SIG$	=	.359E-05	.216E-05	.117E-05	.612E-06		
$1s^2S \rightarrow 4d^2D \quad E_0 = 667.43 \quad E_1 = 41.67 \quad E_{01} = 625.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.107E-02	.940E-03	.792E-03	.704E-03	.743E-03	.933E-03
$SIG$	=	.106E-04	.852E-05	.616E-05	.428E-05	.312E-05	.244E-05
$ABCDE$	=	.133E-02	-.199E-02	.102E-02	.956E-03	.000E+00	
$X$	=	7.30	13.55	26.05	50.82		
$STR$	=	.109E-02	.122E-02	.127E-02	.128E-02		
$SIG$	=	.163E-05	.975E-06	.529E-06	.275E-06		
$1s^2S \rightarrow 5d^2D \quad E_0 = 667.43 \quad E_1 = 26.67 \quad E_{01} = 640.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.582E-03	.508E-03	.427E-03	.377E-03	.401E-03	.494E-03
$SIG$	=	.562E-05	.449E-05	.324E-05	.223E-05	.164E-05	.126E-05
$ABCDE$	=	.705E-03	-.103E-02	.481E-03	.557E-03	.000E+00	
$X$	=	7.30	13.55	26.06	50.88		
$STR$	=	.580E-03	.644E-03	.671E-03	.681E-03		
$SIG$	=	.843E-06	.504E-06	.273E-06	.142E-06		

$1s^2S \rightarrow 6d^2D \quad E_0 = 667.43 \quad E_1 = 18.53 \quad E_{01} = 648.89 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.349E-03	.304E-03	.253E-03	.223E-03	.238E-03	.288E-03
$SIG$	=	.332E-05	.265E-05	.189E-05	.131E-05	.965E-06	.726E-06
$ABCDE$	=	.413E-03	-.606E-03	.296E-03	.325E-03	.000E+00	
$X$	=	7.29	13.55	26.04	50.86		
$STR$	=	.338E-03	.378E-03	.393E-03	.398E-03		
$SIG$	=	.487E-06	.292E-06	.158E-06	.821E-07		
$1s^2S \rightarrow 9d^2D \quad E_0 = 667.43 \quad E_1 = 8.20 \quad E_{01} = 659.23 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.107E-03	.927E-04	.775E-04	.670E-04	.701E-04	.879E-04
$SIG$	=	.100E-05	.797E-06	.572E-06	.386E-06	.281E-06	.218E-06
$ABCDE$	=	.124E-03	-.179E-03	.798E-04	.107E-03	.000E+00	
$X$	=	7.30	13.55	25.94	50.82		
$STR$	=	.102E-03	.113E-03	.117E-03	.120E-03		
$SIG$	=	.144E-06	.863E-07	.467E-07	.243E-07		
$1s^2S \rightarrow 4f^2F \quad E_0 = 667.43 \quad E_1 = 41.67 \quad E_{01} = 625.76 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15
$STR$	=	.679E-04	.526E-04	.349E-04	.213E-04	.167E-04	.183E-04
$SIG$	=	.671E-06	.476E-06	.271E-06	.129E-06	.700E-07	.479E-07
$ABCDE$	=	.196E-04	.597E-05	-.941E-04	.161E-03	.000E+00	
$X$	=	7.30	13.55	26.05	50.82		
$STR$	=	.194E-04	.195E-04	.196E-04	.197E-04		
$SIG$	=	.289E-07	.156E-07	.816E-08	.412E-08		
$1s^2S \rightarrow 6f^2F \quad E_0 = 667.43 \quad E_1 = 18.53 \quad E_{01} = 648.89 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.370E-04	.284E-04	.187E-04	.113E-04	.888E-05	.960E-05
$SIG$	=	.353E-06	.248E-06	.140E-06	.661E-07	.359E-07	.242E-07
$ABCDE$	=	.103E-04	.444E-05	-.552E-04	.911E-04	.000E+00	
$X$	=	7.29	13.55	26.04	50.86		
$STR$	=	.102E-04	.102E-04	.103E-04	.103E-04		
$SIG$	=	.146E-07	.792E-08	.414E-08	.213E-08		
$1s^2S \rightarrow 6g^2G \quad E_0 = 667.43 \quad E_1 = 18.53 \quad E_{01} = 648.89 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.143E-05	.993E-06	.529E-06	.219E-06	.123E-06	.109E-06
$SIG$	=	.136E-07	.867E-08	.396E-08	.128E-08	.497E-09	.274E-09
$ABCDE$	=	.957E-07	.576E-06	-.324E-05	.462E-05	.000E+00	
$X$	=	7.29	13.55	26.04	50.86		
$STR$	=	.108E-06	.111E-06	.113E-06	.112E-06		
$SIG$	=	.155E-09	.862E-10	.454E-10	.232E-10		
$2s^2S \rightarrow 3s^2S \quad E_0 = 166.87 \quad E_1 = 74.14 \quad E_{01} = 92.73 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.171E+00	.173E+00	.178E+00	.183E+00	.193E+00	.202E+00
$SIG$	=	.114E-01	.106E-01	.934E-02	.751E-02	.548E-02	.355E-02
$ABCDE$	=	.212E+00	-.401E-01	-.363E-01	.342E-01	.000E+00	
$X$	=	7.29	13.59	25.99	50.79		
$STR$	=	.207E+00	.208E+00	.208E+00	.211E+00		
$SIG$	=	.208E-02	.112E-02	.587E-03	.304E-03		
$2s^2S \rightarrow 4s^2S \quad E_0 = 166.87 \quad E_1 = 41.67 \quad E_{01} = 125.20 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.346E-01	.347E-01	.353E-01	.364E-01	.378E-01	.396E-01
$SIG$	=	.170E-02	.157E-02	.137E-02	.110E-02	.796E-03	.518E-03
$ABCDE$	=	.415E-01	-.652E-02	-.102E-01	.100E-01	.000E+00	

$X = 7.30 \quad 13.58 \quad 26.05 \quad 50.82$   
 $STR = .404E-01 \quad .413E-01 \quad .405E-01 \quad .413E-01$   
 $SIG = .301E-03 \quad .165E-03 \quad .846E-04 \quad .442E-04$

$2s^2S \rightarrow 5s^2S \quad E_0 = 166.87 \quad E_1 = 26.67 \quad E_{01} = 140.20 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.58 \quad 4.16$   
 $STR = .134E-01 \quad .134E-01 \quad .135E-01 \quad .139E-01 \quad .144E-01 \quad .150E-01$   
 $SIG = .591E-03 \quad .543E-03 \quad .470E-03 \quad .376E-03 \quad .271E-03 \quad .176E-03$   
 $ABCDE = .158E-01 \quad -.260E-02 \quad -.376E-02 \quad .405E-02 \quad .000E+00$   
 $X = 7.28 \quad 13.56 \quad 26.05 \quad 50.88$   
 $STR = .155E-01 \quad .157E-01 \quad .155E-01 \quad .156E-01$   
 $SIG = .103E-03 \quad .563E-04 \quad .290E-04 \quad .149E-04$

$2s^2S \rightarrow 9s^2S \quad E_0 = 166.87 \quad E_1 = 8.20 \quad E_{01} = 158.67 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.58 \quad 4.16$   
 $STR = .673E-02 \quad .673E-02 \quad .677E-02 \quad .691E-02 \quad .721E-02 \quad .749E-02$   
 $SIG = .281E-03 \quad .257E-03 \quad .222E-03 \quad .177E-03 \quad .128E-03 \quad .826E-04$   
 $ABCDE = .789E-02 \quad -.134E-02 \quad -.190E-02 \quad .218E-02 \quad .000E+00$   
 $X = 7.28 \quad 13.55 \quad 26.02 \quad 50.83$   
 $STR = .772E-02 \quad .779E-02 \quad .773E-02 \quad .785E-02$   
 $SIG = .486E-04 \quad .264E-04 \quad .136E-04 \quad .708E-05$

$2s^2S \rightarrow 9s^2S \quad E_0 = 166.87 \quad E_1 = 8.20 \quad E_{01} = 158.67 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.59 \quad 4.16$   
 $STR = .169E-02 \quad .169E-02 \quad .169E-02 \quad .172E-02 \quad .178E-02 \quad .186E-02$   
 $SIG = .662E-04 \quad .604E-04 \quad .518E-04 \quad .411E-04 \quad .296E-04 \quad .191E-04$   
 $ABCDE = .196E-02 \quad -.328E-03 \quad -.473E-03 \quad .573E-03 \quad .000E+00$   
 $X = 7.31 \quad 13.56 \quad 26.04 \quad 50.88$   
 $STR = .192E-02 \quad .192E-02 \quad .192E-02 \quad .195E-02$   
 $SIG = .113E-04 \quad .609E-05 \quad .316E-05 \quad .164E-05$

$2s^2S \rightarrow 3p^2P \quad E_0 = 166.87 \quad E_1 = 74.14 \quad E_{01} = 92.74 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.79 \quad 2.59 \quad 4.16$   
 $STR = .168E+00 \quad .180E+00 \quad .211E+00 \quad .263E+00 \quad .346E+00 \quad .468E+00$   
 $SIG = .112E-01 \quad .110E-01 \quad .111E-01 \quad .108E-01 \quad .980E-02 \quad .825E-02$   
 $ABCDE = -.505E+00 \quad .798E+00 \quad .211E+00 \quad -.379E+00 \quad .546E+00$   
 $X = 7.30 \quad 13.59 \quad 25.99 \quad 50.90$   
 $STR = .678E+00 \quad .980E+00 \quad .132E+01 \quad .166E+01$   
 $SIG = .681E-02 \quad .529E-02 \quad .373E-02 \quad .240E-02$

$2s^2S \rightarrow 4p^2P \quad E_0 = 166.87 \quad E_1 = 41.67 \quad E_{01} = 125.21 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.59 \quad 4.16$   
 $STR = .417E-01 \quad .437E-01 \quad .494E-01 \quad .607E-01 \quad .799E-01 \quad .107E+00$   
 $SIG = .206E-02 \quad .198E-02 \quad .192E-02 \quad .184E-02 \quad .168E-02 \quad .139E-02$   
 $ABCDE = -.547E-01 \quad .901E-01 \quad .609E-01 \quad -.615E-01 \quad .965E-01$   
 $X = 7.30 \quad 13.58 \quad 26.05 \quad 50.90$   
 $STR = .146E+00 \quad .205E+00 \quad .265E+00 \quad .328E+00$   
 $SIG = .109E-02 \quad .821E-03 \quad .554E-03 \quad .350E-03$

$2s^2S \rightarrow 5p^2P \quad E_0 = 166.87 \quad E_1 = 26.67 \quad E_{01} = 140.21 \text{ (eV)}$

$X = 1.10 \quad 1.20 \quad 1.40 \quad 1.80 \quad 2.58 \quad 4.16$   
 $STR = .174E-01 \quad .184E-01 \quad .204E-01 \quad .248E-01 \quad .322E-01 \quad .425E-01$   
 $SIG = .769E-03 \quad .744E-03 \quad .709E-03 \quad .670E-03 \quad .605E-03 \quad .496E-03$   
 $ABCDE = -.141E-01 \quad .211E-01 \quad .375E-01 \quad -.297E-01 \quad .350E-01$   
 $X = 7.28 \quad 13.56 \quad 26.05 \quad 50.88$   
 $STR = .572E-01 \quad .791E-01 \quad .102E+00 \quad .124E+00$   
 $SIG = .382E-03 \quad .283E-03 \quad .190E-03 \quad .119E-03$

$2s^2S \rightarrow 6p^2P \quad E_0 = 166.87 \quad E_1 = 18.53 \quad E_{01} = 148.34 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.916E-02	.961E-02	.105E-01	.126E-01	.164E-01	.217E-01
$SIG$	=	.382E-03	.367E-03	.345E-03	.323E-03	.292E-03	.239E-03
$ABCDE$	=	-.477E-02	.585E-05	.219E-01	-.150E-01	.169E-01	
$X$	=	7.28	13.55	26.02	50.83		
$STR$	=	.291E-01	.400E-01	.508E-01	.619E-01		
$SIG$	=	.183E-03	.135E-03	.896E-04	.558E-04		
$2s^2S \rightarrow 9p^2P \quad E_0 = 166.87 \quad E_1 = 8.20 \quad E_{01} = 158.67 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.244E-02	.251E-02	.272E-02	.324E-02	.418E-02	.551E-02
$SIG$	=	.954E-04	.900E-04	.833E-04	.773E-04	.694E-04	.568E-04
$ABCDE$	=	-.823E-03	.112E-02	.508E-02	-.318E-02	.408E-02	
$X$	=	7.31	13.56	26.04	50.88		
$STR$	=	.734E-02	.995E-02	.127E-01	.153E-01		
$SIG$	=	.431E-04	.315E-04	.209E-04	.129E-04		
$2s^2S \rightarrow 3d^2D \quad E_0 = 166.87 \quad E_1 = 74.07 \quad E_{01} = 92.80 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16
$STR$	=	.363E+00	.369E+00	.382E+00	.393E+00	.409E+00	.458E+00
$SIG$	=	.242E-01	.226E-01	.200E-01	.161E-01	.116E-01	.808E-02
$ABCDE$	=	.714E+00	-.145E+01	.212E+01	-.106E+01	.000E+00	
$X$	=	7.30	13.59	25.99	50.90		
$STR$	=	.558E+00	.643E+00	.671E+00	.679E+00		
$SIG$	=	.561E-02	.347E-02	.190E-02	.979E-03		
$2s^2S \rightarrow 4d^2D \quad E_0 = 166.87 \quad E_1 = 41.67 \quad E_{01} = 125.21 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.639E-01	.629E-01	.620E-01	.614E-01	.615E-01	.639E-01
$SIG$	=	.315E-02	.285E-02	.241E-02	.186E-02	.129E-02	.834E-03
$ABCDE$	=	.892E-01	-.148E+00	.238E+00	-.118E+00	.000E+00	
$X$	=	7.29	13.58	26.04	50.88		
$STR$	=	.723E-01	.825E-01	.855E-01	.858E-01		
$SIG$	=	.539E-03	.330E-03	.178E-03	.916E-04		
$2s^2S \rightarrow 5d^2D \quad E_0 = 166.87 \quad E_1 = 26.67 \quad E_{01} = 140.21 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.58	4.16
$STR$	=	.243E-01	.236E-01	.225E-01	.216E-01	.211E-01	.215E-01
$SIG$	=	.107E-02	.954E-03	.781E-03	.583E-03	.396E-03	.250E-03
$ABCDE$	=	.291E-01	-.461E-01	.782E-01	-.368E-01	.000E+00	
$X$	=	7.28	13.55	26.03	50.85		
$STR$	=	.238E-01	.271E-01	.279E-01	.280E-01		
$SIG$	=	.159E-03	.969E-04	.521E-04	.267E-04		
$2s^2S \rightarrow 6d^2D \quad E_0 = 166.87 \quad E_1 = 18.53 \quad E_{01} = 148.34 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16
$STR$	=	.123E-01	.118E-01	.111E-01	.103E-01	.100E-01	.101E-01
$SIG$	=	.512E-03	.451E-03	.364E-03	.264E-03	.178E-03	.111E-03
$ABCDE$	=	.135E-01	-.208E-01	.356E-01	-.157E-01	.000E+00	
$X$	=	7.28	13.55	26.02	50.83	1	
$STR$	=	.111E-01	.126E-01	.130E-01	.130E-01	.13	
$SIG$	=	.702E-04	.426E-04	.229E-04	.117E-04	.59	
$2s^2S \rightarrow 9d^2D \quad E_0 = 166.87 \quad E_1 = 8.20 \quad E_{01} = 158.67 \text{ (eV)}$							
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16
$STR$	=	.314E-02	.294E-02	.271E-02	.248E-02	.234E-02	.234E-02
$SIG$	=	.123E-03	.105E-03	.830E-04	.591E-04	.389E-04	.241E-04
$ABCDE$	=	.309E-02	-.459E-02	.795E-02	-.315E-02	.000E+00	

$X$	=	7.31	13.56	26.04	50.88			
$STR$	=	.257E-02	.288E-02	.298E-02	.298E-02			
$SIG$	=	.151E-04	.911E-05	.492E-05	.252E-05			
$2s^2S \rightarrow 4f^2F \quad E_0 = 166.87 \quad E_1 = 41.67 \quad E_{01} = 125.21 \text{ (eV)}$								
$X$	=	1.10	1.20	1.40	1.80	2.59	4.16	
$STR$	=	.424E-01	.400E-01	.366E-01	.324E-01	.322E-01	.392E-01	
$SIG$	=	.209E-02	.182E-02	.142E-02	.979E-03	.676E-03	.512E-03	
$ABCDE$	=	.457E-01	-.306E-01	-.128E-01	.484E-01	.000E+00		
$X$	=	7.29	13.58	26.04	50.88	1		
$STR$	=	.433E-01	.440E-01	.441E-01	.445E-01	.44		
$SIG$	=	.323E-03	.176E-03	.921E-04	.475E-04	.24		
$2s^2S \rightarrow 6f^2F \quad E_0 = 166.87 \quad E_1 = 18.53 \quad E_{01} = 148.34 \text{ (eV)}$								
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16	
$STR$	=	.125E-01	.116E-01	.103E-01	.891E-02	.844E-02	.994E-02	
$SIG$	=	.520E-03	.442E-03	.339E-03	.228E-03	.150E-03	.110E-03	
$ABCDE$	=	.117E-01	-.893E-02	.163E-02	.104E-01	.000E+00		
$X$	=	7.28	13.55	26.02	50.83			
$STR$	=	.111E-01	.112E-01	.113E-01	.114E-01			
$SIG$	=	.696E-04	.380E-04	.199E-04	.102E-04			
$2s^2S \rightarrow 6g^2G \quad E_0 = 166.87 \quad E_1 = 18.53 \quad E_{01} = 148.34 \text{ (eV)}$								
$X$	=	1.10	1.20	1.40	1.79	2.58	4.16	
$STR$	=	.269E-02	.220E-02	.156E-02	.109E-02	.117E-02	.130E-02	
$SIG$	=	.112E-03	.841E-04	.514E-04	.280E-04	.208E-04	.143E-04	
$ABCDE$	=	.145E-02	.420E-04	-.495E-02	.708E-02	.000E+00		
$X$	=	7.28	13.55	26.02	50.83			
$STR$	=	.135E-02	.143E-02	.145E-02	.145E-02			
$SIG$	=	.852E-05	.483E-05	.256E-05	.131E-05			
$5s^2S \rightarrow 6p^2P \quad E_0 = 26.67 \quad E_1 = 18.53 \quad E_{01} = 8.13 \text{ (eV)}$								
$X$	=	1.10	1.20	1.40	1.79	2.59	4.15	
$STR$	=	.558E+00	.658E+00	.695E+00	.925E+00	.119E+01	.195E+01	
$SIG$	=	.423E+00	.457E+00	.415E+00	.431E+00	.384E+00	.391E+00	
$ABCDE$	=	-.137E+02	.161E+02	.827E+01	-.108E+02	.821E+01		
$X$	=	7.29	13.60	25.98	50.86			
$STR$	=	.489E+01	.911E+01	.138E+02	.189E+02			
$SIG$	=	.559E+00	.558E+00	.441E+00	.310E+00			
$5p^2P \rightarrow 6d^2D \quad E_0 = 26.67 \quad E_1 = 18.53 \quad E_{01} = 8.13 \text{ (eV)}$								
$X$	=	1.10	1.20	1.40	1.79	2.59	4.16	
$STR$	=	.434E+01	.464E+01	.487E+01	.625E+01	.809E+01	.103E+02	
$SIG$	=	.110E+01	.108E+01	.968E+00	.971E+00	.870E+00	.689E+00	
$ABCDE$	=	-.403E+02	.565E+02	.125E+02	-.266E+02	.263E+02		
$X$	=	7.30	13.49	26.00	50.90			
$STR$	=	.191E+02	.328E+02	.483E+02	.646E+02			
$SIG$	=	.726E+00	.676E+00	.517E+00	.353E+00			

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