SUPPLEMENTARY MATERIAL

Hartree-Fock implementation using a Laguerre-based wave function for the ground state and correlation energies of two-electron atoms

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I. HF ENERGY CONVERGENCE DATA, $Z = Z_C^{FC}, 1, Z_C^{HF}, 2 \ldots 18$

TABLE I: Convergence of the ground state energy with increasing basis set size for the Hartree Fock (HF) implementations. Electronic energies in a.u. $Z_C^{FC} = 0.911\ 028\ 224\ 077\ 255\ 73$ and $Z_C^{HF} = 1.031\ 177\ 528$.

No. Terms	Z_C^{FC}	H^-	Z_C^{HF}	He	Li^+
1	-0.358 236 035 017	-0.472 656 249 999	-0.516 497 389 252	-2.847 656 249 999	-7.222 656 249 999
5	-0.373 875 367 890	-0.487 916 197 476	-0.531 652 979 306	-2.861 679 675 254	-7.236 414 652 730
7	-0.373 904 790 600	-0.487 929 420 478	-0.531 663 343 091	-2.861 679 763 443	-7.236 414 822 293
10	-0.373 906 162 092	-0.487 929 700 699	-0.531 663 518 346	-2.861 679 993 922	-7.236 415 200 781
15	-0.373 906 223 491	-0.487 929 733 497	-0.531 663 546 028	-2.861 679 995 609	-7.236 415 201 451
17	-0.373 906 226 807	-0.487 929 734 257	-0.531 663 546 953	-2.861 679 995 612	-7.236 415 201 452
20	-0.373 906 227 545	-0.487 929 734 369	-0.531 663 547 020	-2.861 679 995 612	-7.236 415 201 452

TABLE II: Convergence of the ground state energy with increasing basis set size for the Hartree Fock (HF) implementations. Electronic energies in a.u.

No. Terms	Be^{2+}	B^{3+}	C^{4+}	N^{5+}	O^{6+}
1	-13.597 656 249 999 999	-21.972 656 249 999 999	-32.347 656 249 999 999	-44.722 656 249 999 999	-59.097 656 249 999 999 999
5	-13.611 298 630 035 416	-21.986 233 481 104 705	-32.361 191 752 998 586	-44.736 162 737 745 367	-59.111 141 392 734 125 071
7	-13.611 299 039 644 192	-21.986 234 065 967 765	-32.361 192 464 386 683	-44.736 163 542 837 029	-59.111 142 269 062 051 700
10	-13.611 299 430 190 333	-21.986 234 466 493 603	-32.361 192 875 437 538	-44.736 163 964 691 319	-59.111 142 701 680 970 929
15	-13.611 299 430 618 882	-21.986 234 466 824 211	-32.361 192 875 717 922	-44.736 163 964 942 404	-59.111 142 701 913 598 647
17	-13.611 299 430 619 108	-21.986 234 466 824 344	-32.361 192 875 718 015	-44.736 163 964 942 476	-59.111 142 701 913 658 340
20	-13.611 299 430 619 111	-21.986 234 466 824 346	-32.361 192 875 718 016	-44.736 163 964 942 477	-59.111 142 701 913 658 996

TABLE III: Convergence of the ground state energy with increasing basis set size for the Hartree Fock (HF) implementations. Electronic energies in a.u.

No. Terms	F^{7+}	Ne^{8+}	Na^{9+}	Mg^{10+}	Al^{11+}
1	-75.472 656 249 999 999 999	-93.847 656 249 999 999 999	-114.222 656 249 999 999	-136.597 656 249 999 999	-160.972 656 249 999 999
5	-75.486 125 031 172 340 291	-93.861 112 090 073 102 901	-114.236 101 598 258 079	-136.611 092 920 454 676	-160.986 085 623 617 767
7	-75.486 125 962 883 168 723	-93.861 113 065 647 049 849	-114.236 102 609 105 195	-136.611 093 960 025 489	-160.986 086 686 822 068
10	-75.486 126 406 040 023 423	-93.861 113 519 019 125 766	-114.236 103 072 327 331	-136.611 094 432 719 935	-160.986 087 168 614 771
15	-75.486 126 406 260 463 382	-93.861 113 519 231 297 922	-114.236 103 072 533 832	-136.611 094 432 922 564	-160.986 087 168 814 816
17	-75.486 126 406 260 515 053	-93.861 113 519 231 344 075	-114.236 103 072 533 874	-136.611 094 432 922 603	-160.986 087 168 814 853
20	-75.486 126 406 260 515 678	-93.861 113 519 231 344 697	-114.236 103 072 533 875	-136.611 094 432 922 604	-160.986 087 168 814 854

TABLE IV: Convergence of the ground state energy with increasing basis set size for the Hartree Fock (HF) implementations. Electronic energies in a.u.

No. Terms	Si^{12+}	P^{13+}	S^{14+}	Cl^{15+}	Ar^{16+}
1	-187.347 656 249 999 999 999	-215.722 656 249 999 999	-246.097 656 249 999 999	-278.472 656 249 999 999	-312.847 656 249 999 999
5	-187.361 079 402 387 501 706	-215.736 074 035 256 961	-246.111 069 357 636 948	-278.486 065 244 676 984	-312.861 061 599 954 332
7	-187.361 080 485 203 287 374	-215.736 075 134 460 314	-246.111 070 470 611 033	-278.486 066 369 274 148	-312.861 062 734 394 675
10	-187.361 080 975 732 496 603	-215.736 075 633 380 852	-246.111 070 977 596 087	-278.486 066 884 015 664	-312.861 063 256 602 976
15	-187.361 080 975 930 910 815	-215.736 075 633 578 353	-246.111 070 977 793 227	-278.486 066 884 212 876	-312.861 063 256 800 601
17	-187.361 080 975 930 946 039	-215.736 075 633 578 387	-246.111 070 977 793 260	-278.486 066 884 212 907	-312.861 063 256 800 632
20	-187.361 080 975 930 946 755	-215.736 075 633 578 388	-246.111 070 977 793 261	-278.486 066 884 212 908	-312.861 063 256 800 633

II. HF WAVEFUNCTION COEFFICIENTS (32 DIGITS)

TABLE V: Coefficients for the 20-term Hartree-Fock wavefunction for the critical nuclear charge system, Z_C^{FC}= 0.911 028 224 077 255 73; A=1.538 931 848 111 260 827 123 435 023 684 1.

Z_C^{FC}	
Term	Coefficient
L(0,Ar_1)	0.319 530 790 412 458 434 944 726 111 993 81
L(1,Ar_1)	-0.991 927 063 747 523 863 706 965 066 275 99$\times 10^{-2}$
L(2,Ar_1)	0.204 486 962 370 727 482 901 541 682 102 89$\times 10^{-1}$
L(3,Ar_1)	-0.312 274 691 896 952 800 959 302 951 476 47$\times 10^{-2}$
L(4,Ar_1)	0.293 007 731 805 735 080 721 036 686 677 77$\times 10^{-2}$
L(5,Ar_1)	-0.890 968 700 289 542 849 125 124 986 462 78$\times 10^{-3}$
L(6,Ar_1)	0.547 458 786 845 026 467 315 117 590 352 76$\times 10^{-3}$
L(7,Ar_1)	-0.263 838 939 331 530 755 058 193 652 443 76$\times 10^{-3}$
L(8,Ar_1)	0.114 389 168 688 555 655 589 677 524 010 45$\times 10^{-3}$
L(9,Ar_1)	-0.819 654 100 942 739 873 924 946 550 339 15$\times 10^{-4}$
L(10,Ar_1)	0.244 795 700 507 104 238 644 602 001 508 56$\times 10^{-4}$
L(11,Ar_1)	-0.266 218 889 097 547 984 859 611 527 347 82$\times 10^{-4}$
L(12,Ar_1)	0.488 561 151 801 401 890 722 580 955 376 25$\times 10^{-5}$
L(13,Ar_1)	-0.897 022 584 157 529 049 081 269 457 096 64$\times 10^{-5}$
L(14,Ar_1)	0.740 797 449 246 132 712 391 123 279 434 31$\times 10^{-6}$
L(15,Ar_1)	-0.308 790 247 112 550 393 305 961 932 122 65$\times 10^{-5}$
L(16,Ar_1)	0.630 294 401 947 644 002 984 731 087 098 72$\times 10^{-8}$
L(17,Ar_1)	-0.104 433 069 319 548 757 587 286 572 480 64$\times 10^{-5}$
L(18,Ar_1)	-0.404 552 694 578 208 355 060 412 178 757 13$\times 10^{-7}$
L(19,Ar_1)	-0.300 249 006 931 662 245 738 241 179 661 92$\times 10^{-6}$

TABLE VI: Coefficients for the 20-term Hartree-Fock wavefunction for H^-. A=1.966 221 680 513 194 094 708 543 676 580 5

H^-	
Term	Coefficient
$L(0,Ar_1)$	0.408 748 786 103 265 300 553 173 346 934 37
$L(1,Ar_1)$	$-0.373\,592\,095\,204\,363\,833\,899\,914\,448\,938\,51\times10^{-1}$
$L(2,Ar_1)$	$0.261\,212\,171\,512\,222\,185\,114\,504\,353\,426\,53\times10^{-1}$
$L(3,Ar_1)$	$-0.688\,034\,301\,951\,407\,407\,071\,569\,327\,179\,27\times10^{-2}$
$L(4,Ar_1)$	$0.364\,422\,187\,033\,625\,519\,788\,015\,745\,192\,24\times10^{-2}$
$L(5,Ar_1)$	$-0.144\,042\,864\,810\,974\,119\,975\,464\,021\,674\,32\times10^{-2}$
$L(6,Ar_1)$	$0.639\,283\,133\,284\,785\,327\,217\,222\,373\,375\,14\times10^{-3}$
$L(7,Ar_1)$	$-0.328\,304\,601\,185\,909\,874\,083\,269\,152\,776\,75\times10^{-3}$
$L(8,Ar_1)$	$0.122\,482\,874\,869\,464\,585\,453\,001\,100\,977\,83\times10^{-3}$
$L(9,Ar_1)$	$-0.798\,460\,106\,665\,175\,441\,627\,947\,581\,768\,87\times10^{-4}$
$L(10,Ar_1)$	$0.238\,669\,856\,590\,200\,998\,259\,138\,406\,848\,16\times10^{-4}$
$L(11,Ar_1)$	$-0.205\,286\,190\,165\,554\,749\,360\,750\,915\,441\,69\times10^{-4}$
$L(12,Ar_1)$	$0.441\,737\,116\,892\,279\,778\,199\,861\,007\,461\,10\times10^{-5}$
$L(13,Ar_1)$	$-0.554\,648\,596\,449\,290\,471\,687\,262\,220\,341\,05\times10^{-5}$
$L(14,Ar_1)$	$0.683\,282\,072\,723\,002\,456\,870\,975\,054\,058\,34\times10^{-6}$
$L(15,Ar_1)$	$-0.155\,840\,491\,631\,176\,049\,671\,507\,381\,432\,91\times10^{-5}$
$L(16,Ar_1)$	$0.523\,415\,687\,037\,928\,087\,774\,554\,548\,772\,55\times10^{-7}$
$L(17,Ar_1)$	$-0.440\,605\,230\,869\,969\,929\,316\,338\,089\,782\,32\times10^{-6}$
$L(18,Ar_1)$	$-0.118\,856\,925\,805\,728\,454\,391\,451\,249\,653\,19\times10^{-7}$
$L(19,Ar_1)$	$-0.109\,439\,954\,560\,411\,330\,970\,194\,951\,690\,50\times10^{-6}$

TABLE VII: Coefficients for the 20-term Hartree-Fock wavefunction for the critical nuclear charge system, Z_C^{HF}= 1.031 177 528; A=2.102 578 153 549 737 501 662 429 764 354 4.

Z_C^{HF}	
Term	Coefficient
L(0,Ar_1)	0.439 817 790 254 778 398 160 130 819 293 32
L(1,Ar_1)	$-0.463\,611\,019\,180\,504\,945\,671\,137\,099\,824\,08\times10^{-1}$
L(2,Ar_1)	$0.283\,532\,229\,583\,193\,071\,131\,609\,415\,767\,48\times10^{-1}$
L(3,Ar_1)	$-0.800\,341\,845\,634\,980\,804\,153\,625\,209\,192\,20\times10^{-2}$
L(4,Ar_1)	$0.391\,855\,717\,083\,602\,716\,535\,341\,012\,753\,81\times10^{-2}$
L(5,Ar_1)	$-0.158\,343\,543\,646\,637\,000\,645\,077\,439\,916\,81\times10^{-2}$
L(6,Ar_1)	$0.671\,639\,897\,385\,808\,327\,446\,541\,788\,576\,80\times10^{-3}$
L(7,Ar_1)	$-0.341\,182\,320\,680\,073\,415\,200\,205\,513\,350\,77\times10^{-3}$
L(8,Ar_1)	$0.124\,796\,980\,624\,352\,886\,903\,894\,276\,625\,67\times10^{-3}$
L(9,Ar_1)	$-0.783\,852\,117\,703\,519\,046\,086\,431\,878\,713\,32\times10^{-4}$
L(10,Ar_1)	$0.235\,183\,282\,255\,327\,334\,597\,836\,191\,544\,33\times10^{-4}$
L(11,Ar_1)	$-0.190\,346\,911\,451\,716\,080\,749\,711\,274\,044\,84\times10^{-4}$
L(12,Ar_1)	$0.421\,804\,043\,765\,014\,094\,657\,700\,893\,397\,17\times10^{-5}$
L(13,Ar_1)	$-0.486\,349\,217\,443\,029\,514\,003\,014\,264\,560\,33\times10^{-5}$
L(14,Ar_1)	$0.639\,931\,500\,634\,764\,148\,580\,080\,754\,059\,79\times10^{-6}$
L(15,Ar_1)	$-0.129\,626\,124\,187\,760\,739\,862\,226\,370\,661\,83\times10^{-5}$
L(16,Ar_1)	$0.524\,703\,388\,411\,412\,465\,903\,688\,165\,429\,26\times10^{-7}$
L(17,Ar_1)	$-0.349\,426\,878\,475\,727\,960\,317\,841\,219\,106\,20\times10^{-6}$
L(18,Ar_1)	$-0.846\,073\,949\,122\,272\,527\,974\,165\,255\,149\,09\times10^{-8}$
L(19,Ar_1)	$-0.833\,838\,243\,403\,200\,951\,704\,113\,790\,873\,81\times10^{-7}$

TABLE VIII: Coefficients for the 20-term Hartree-Fock wavefunction for the Helium atom, He. A=5.581 838 558 742 063 150 341 451 412 277 0

He	
Term	Coefficient
L(0,Ar_1)	1.592 986 348 147 179 388 555 164 056 614 6
L(1,Ar_1)	−0.335 099 828 443 415 308 482 560 216 871 77
L(2,Ar_1)	0.109 270 405 335 665 060 311 603 209 912 61
L(3,Ar_1)	$-0.341\,339\,182\,671\,154\,435\,864\,847\,583\,582\,50\times10^{-1}$
L(4,Ar_1)	$0.107\,918\,796\,425\,801\,080\,085\,592\,204\,572\,64\times10^{-1}$
L(5,Ar_1)	$-0.372\,420\,359\,427\,708\,818\,774\,281\,463\,617\,43\times10^{-2}$
L(6,Ar_1)	$0.113\,798\,867\,617\,001\,563\,618\,539\,057\,049\,64\times10^{-2}$
L(7,Ar_1)	$-0.425\,093\,295\,103\,237\,015\,213\,057\,620\,409\,03\times10^{-3}$
L(8,Ar_1)	$0.120\,865\,546\,071\,441\,611\,524\,181\,252\,208\,41\times10^{-3}$
L(9,Ar_1)	$-0.506\,866\,331\,658\,666\,805\,389\,626\,621\,419\,07\times10^{-4}$
L(10,Ar_1)	$0.124\,010\,803\,754\,103\,510\,281\,620\,789\,910\,63\times10^{-4}$
L(11,Ar_1)	$-0.638\,435\,417\,513\,208\,883\,050\,710\,167\,701\,58\times10^{-5}$
L(12,Ar_1)	$0.113\,911\,876\,757\,299\,827\,437\,052\,521\,317\,05\times10^{-5}$
L(13,Ar_1)	$-0.863\,069\,336\,987\,805\,804\,992\,869\,182\,012\,42\times10^{-6}$
L(14,Ar_1)	$0.731\,146\,657\,888\,653\,920\,092\,536\,343\,753\,00\times10^{-7}$
L(15,Ar_1)	$-0.125\,239\,701\,312\,271\,285\,170\,812\,083\,769\,77\times10^{-6}$
L(16,Ar_1)	$-0.202\,142\,892\,424\,477\,451\,064\,447\,305\,151\,53\times10^{-8}$
L(17,Ar_1)	$-0.184\,496\,489\,858\,410\,056\,316\,185\,056\,460\,57\times10^{-7}$
L(18,Ar_1)	$-0.138\,455\,047\,253\,331\,015\,959\,839\,610\,730\,49\times10^{-8}$
L(19,Ar_1)	$-0.225\,003\,591\,227\,658\,080\,362\,004\,989\,574\,88\times10^{-8}$

TABLE IX: Coefficients for the 20-term Hartree-Fock wavefunction for the Lithium ion, Li^+. A=9.029 713 069 168 782 990 481 560 037 470 4

Li^+	
Term	Coefficient
L(0,Ar_1)	3.181 254 459 862 959 675 928 541 575 144 6
L(1,Ar_1)	-0.735 213 498 123 722 526 888 538 596 112 97
L(2,Ar_1)	0.219 497 469 830 558 240 067 857 357 925 23
L(3,Ar_1)	-0.652 966 354 877 639 427 807 799 839 608 92$\times 10^{-1}$
L(4,Ar_1)	0.191 234 142 566 875 628 250 341 513 270 93$\times 10^{-1}$
L(5,Ar_1)	-0.604 417 255 947 272 796 367 538 096 699 80$\times 10^{-2}$
L(6,Ar_1)	0.173 298 699 772 672 686 547 727 596 555 23$\times 10^{-2}$
L(7,Ar_1)	-0.575 481 583 187 267 935 501 661 098 304 67$\times 10^{-3}$
L(8,Ar_1)	0.157 411 985 426 736 789 826 908 407 489 38$\times 10^{-3}$
L(9,Ar_1)	-0.564 571 087 915 219 204 598 656 249 843 87$\times 10^{-4}$
L(10,Ar_1)	0.139 570 078 776 934 003 730 301 135 802 79$\times 10^{-4}$
L(11,Ar_1)	-0.576 444 788 183 271 270 142 123 998 685 78$\times 10^{-5}$
L(12,Ar_1)	0.116 025 691 677 061 425 380 690 015 388 56$\times 10^{-5}$
L(13,Ar_1)	-0.618 763 321 826 151 263 591 018 384 852 98$\times 10^{-6}$
L(14,Ar_1)	0.844 862 927 168 177 497 487 725 506 746 50$\times 10^{-7}$
L(15,Ar_1)	-0.685 093 162 071 781 275 552 402 914 396 49$\times 10^{-7}$
L(16,Ar_1)	0.548 563 051 574 898 501 101 854 694 076 97$\times 10^{-8}$
L(17,Ar_1)	-0.691 354 603 288 729 365 970 002 116 593 89$\times 10^{-8}$
L(18,Ar_1)	0.753 233 790 126 721 434 592 366 585 194 95$\times 10^{-9}$
L(19,Ar_1)	-0.431 677 890 618 985 989 447 874 086 078 02$\times 10^{-9}$

TABLE X: Coefficients for the 20-term Hartree-Fock wavefunction for Be^{2+}. A=12.742 932 905 780 314 127 774 412 695 848

Be^{2+}	
Term	Coefficient
L(0,Ar_1)	5.138 478 261 010 630 073 099 044 803 303 4
L(1,Ar_1)	$-1.285\,632\,612\,520\,870\,277\,507\,576\,142\,030\,1$
L(2,Ar_1)	0.380 266 754 245 698 494 895 054 711 243 92
L(3,Ar_1)	-0.113 744 858 095 673 435 219 101 251 309 29
L(4,Ar_1)	$0.334\,483\,983\,844\,603\,424\,859\,378\,623\,597\,96\times10^{-1}$
L(5,Ar_1)	$-0.103\,662\,793\,453\,486\,556\,942\,253\,914\,024\,93\times10^{-1}$
L(6,Ar_1)	$0.303\,177\,593\,535\,327\,980\,606\,923\,178\,796\,87\times10^{-2}$
L(7,Ar_1)	$-0.961\,398\,065\,061\,562\,903\,330\,304\,852\,995\,97\times10^{-3}$
L(8,Ar_1)	$0.276\,788\,411\,858\,984\,183\,181\,283\,286\,778\,50\times10^{-3}$
L(9,Ar_1)	$-0.904\,907\,080\,458\,414\,508\,597\,642\,067\,690\,52\times10^{-4}$
L(10,Ar_1)	$0.251\,963\,049\,631\,628\,810\,369\,358\,004\,097\,80\times10^{-4}$
L(11,Ar_1)	$-0.864\,753\,633\,226\,862\,948\,466\,514\,410\,895\,33\times10^{-5}$
L(12,Ar_1)	$0.227\,289\,470\,292\,891\,551\,106\,328\,803\,728\,02\times10^{-5}$
L(13,Ar_1)	$-0.836\,418\,401\,353\,281\,609\,650\,854\,506\,438\,31\times10^{-6}$
L(14,Ar_1)	$0.204\,909\,206\,442\,860\,298\,500\,709\,458\,856\,61\times10^{-6}$
L(15,Ar_1)	$-0.796\,661\,000\,220\,572\,099\,614\,695\,151\,856\,96\times10^{-7}$
L(16,Ar_1)	$0.198\,550\,124\,180\,672\,955\,677\,090\,593\,928\,58\times10^{-7}$
L(17,Ar_1)	$-0.666\,982\,879\,819\,820\,449\,106\,401\,375\,068\,17\times10^{-8}$
L(18,Ar_1)	$0.237\,331\,933\,505\,627\,276\,360\,039\,620\,803\,85\times10^{-8}$
L(19,Ar_1)	$-0.413\,005\,933\,576\,713\,548\,920\,215\,356\,601\,75\times10^{-9}$

TABLE XI: Coefficients for the 20-term Hartree-Fock wavefunction for B^{3+}. A=16.361 146 434 512 837 019 274 896 603 967

B^{3+}	
Term	Coefficient
L(0,Ar_1)	7.367 842 450 991 950 121 061 940 754 947 5
L(1,Ar_1)	$-1.903\,422\,363\,209\,819\,925\,827\,276\,505\,787\,2$
L(2,Ar_1)	0.558 071 232 413 481 054 330 622 369 280 92
L(3,Ar_1)	-0.165 744 191 470 613 574 436 666 194 680 80
L(4,Ar_1)	$0.484\,643\,272\,062\,433\,679\,131\,083\,535\,457\,89\times10^{-1}$
L(5,Ar_1)	$-0.147\,686\,633\,678\,103\,890\,508\,340\,632\,837\,74\times10^{-1}$
L(6,Ar_1)	$0.431\,036\,167\,963\,117\,178\,631\,233\,188\,681\,72\times10^{-2}$
L(7,Ar_1)	$-0.133\,308\,879\,929\,776\,055\,332\,578\,419\,373\,62\times10^{-2}$
L(8,Ar_1)	$0.385\,942\,663\,808\,958\,006\,838\,735\,070\,068\,32\times10^{-3}$
L(9,Ar_1)	$-0.121\,552\,595\,528\,167\,583\,342\,259\,048\,391\,85\times10^{-3}$
L(10,Ar_1)	$0.345\,631\,268\,465\,649\,245\,238\,057\,541\,610\,36\times10^{-4}$
L(11,Ar_1)	$-0.111\,840\,400\,002\,205\,073\,253\,748\,669\,531\,28\times10^{-4}$
L(12,Ar_1)	$0.308\,940\,090\,596\,104\,862\,467\,966\,445\,011\,45\times10^{-5}$
L(13,Ar_1)	$-0.103\,347\,277\,540\,672\,243\,804\,836\,792\,443\,01\times10^{-5}$
L(14,Ar_1)	$0.278\,504\,546\,184\,157\,037\,109\,349\,161\,875\,34\times10^{-6}$
L(15,Ar_1)	$-0.935\,440\,768\,684\,124\,950\,796\,088\,215\,555\,11\times10^{-7}$
L(16,Ar_1)	$0.266\,870\,401\,675\,502\,314\,009\,878\,699\,904\,43\times10^{-7}$
L(17,Ar_1)	$-0.758\,054\,091\,897\,506\,744\,258\,102\,409\,704\,50\times10^{-8}$
L(18,Ar_1)	$0.292\,652\,118\,355\,557\,592\,722\,397\,967\,603\,96\times10^{-8}$
L(19,Ar_1)	$-0.528\,646\,486\,506\,692\,696\,114\,338\,317\,768\,94\times10^{-9}$

TABLE XII: Coefficients for the 20-term Hartree-Fock wavefunction for C^{4+}. A=19.955 542 847 357 254 173 202 377 159 793

C^{4+}	
Term	Coefficient
L(0,Ar_1)	$-9.845\,233\,298\,994\,372\,199\,157\,681\,491\,060\,3$
L(1,Ar_1)	$2.589\,835\,469\,682\,587\,808\,117\,086\,546\,311\,1$
L(2,Ar_1)	$-0.754\,510\,822\,814\,286\,831\,815\,744\,440\,350\,11$
L(3,Ar_1)	$0.222\,575\,629\,329\,016\,850\,807\,814\,386\,822\,33$
L(4,Ar_1)	$-0.647\,471\,337\,107\,150\,181\,968\,489\,360\,519\,42\times10^{-1}$
L(5,Ar_1)	$0.194\,910\,756\,149\,547\,192\,093\,257\,027\,672\,88\times10^{-1}$
L(6,Ar_1)	$-0.566\,721\,017\,146\,606\,500\,332\,725\,056\,576\,20\times10^{-2}$
L(7,Ar_1)	$0.172\,441\,920\,956\,283\,134\,830\,788\,683\,067\,64\times10^{-2}$
L(8,Ar_1)	$-0.499\,021\,069\,293\,092\,560\,057\,298\,858\,396\,26\times10^{-3}$
L(9,Ar_1)	$0.153\,735\,457\,724\,997\,073\,137\,098\,897\,149\,20\times10^{-3}$
L(10,Ar_1)	$-0.439\,895\,660\,083\,497\,332\,122\,625\,015\,339\,32\times10^{-4}$
L(11,Ar_1)	$0.137\,922\,601\,461\,648\,752\,401\,846\,288\,162\,07\times10^{-4}$
L(12,Ar_1)	$-0.387\,866\,762\,396\,757\,882\,503\,752\,712\,357\,41\times10^{-5}$
L(13,Ar_1)	$0.123\,933\,366\,002\,103\,099\,352\,469\,038\,060\,82\times10^{-5}$
L(14,Ar_1)	$-0.345\,269\,829\,878\,584\,139\,549\,322\,956\,200\,95\times10^{-6}$
L(15,Ar_1)	$0.109\,201\,094\,250\,668\,504\,950\,440\,984\,638\,30\times10^{-6}$
L(16,Ar_1)	$-0.323\,033\,082\,266\,574\,462\,829\,417\,840\,047\,34\times10^{-7}$
L(17,Ar_1)	$0.880\,434\,319\,429\,065\,700\,572\,907\,264\,730\,78\times10^{-8}$
L(18,Ar_1)	$-0.332\,549\,979\,152\,215\,069\,932\,952\,869\,399\,13\times10^{-8}$
L(19,Ar_1)	$0.667\,500\,211\,923\,232\,933\,421\,228\,561\,390\,94\times10^{-9}$

TABLE XIII: Coefficients for the 20-term Hartree-Fock wavefunction for N^{5+}. A=23.539 181 744 757 669 317 526 579 881 473

N^{5+}	
Term	Coefficient
L(0,Ar_1)	$-12.548\,796\,023\,455\,117\,344\,122\,582\,685\,707$
L(1,Ar_1)	3.339 763 669 820 612 900 481 184 849 586 0
L(2,Ar_1)	-0.968 395 457 093 720 341 104 253 389 372 07
L(3,Ar_1)	0.284 081 058 888 638 270 892 466 107 973 23
L(4,Ar_1)	$-0.822\,951\,515\,817\,501\,609\,551\,952\,941\,899\,16\times10^{-1}$
L(5,Ar_1)	$0.245\,494\,041\,672\,459\,893\,509\,879\,950\,955\,92\times10^{-1}$
L(6,Ar_1)	$-0.711\,282\,718\,338\,138\,812\,884\,693\,234\,068\,62\times10^{-2}$
L(7,Ar_1)	$0.213\,951\,097\,938\,621\,243\,595\,889\,099\,659\,09\times10^{-2}$
L(8,Ar_1)	$-0.618\,062\,321\,843\,543\,148\,828\,521\,034\,524\,22\times10^{-3}$
L(9,Ar_1)	$0.187\,608\,693\,997\,058\,981\,496\,196\,664\,752\,26\times10^{-3}$
L(10,Ar_1)	$-0.537\,826\,125\,549\,535\,158\,405\,071\,043\,057\,97\times10^{-4}$
L(11,Ar_1)	$0.165\,292\,952\,096\,631\,630\,647\,646\,543\,281\,86\times10^{-4}$
L(12,Ar_1)	$-0.468\,482\,384\,604\,663\,584\,769\,911\,158\,522\,07\times10^{-5}$
L(13,Ar_1)	$0.145\,702\,820\,174\,363\,877\,939\,234\,323\,399\,41\times10^{-5}$
L(14,Ar_1)	$-0.411\,751\,723\,351\,044\,867\,653\,765\,741\,612\,72\times10^{-6}$
L(15,Ar_1)	$0.126\,235\,621\,421\,607\,501\,555\,980\,883\,645\,88\times10^{-6}$
L(16,Ar_1)	$-0.376\,949\,314\,573\,666\,463\,049\,245\,974\,727\,26\times10^{-7}$
L(17,Ar_1)	$0.101\,911\,947\,212\,135\,743\,812\,554\,324\,146\,94\times10^{-7}$
L(18,Ar_1)	$-0.369\,822\,540\,033\,181\,993\,189\,338\,570\,303\,27\times10^{-8}$
L(19,Ar_1)	$0.815\,727\,554\,243\,856\,973\,092\,565\,926\,526\,26\times10^{-9}$

TABLE XIV: Coefficients for the 20-term Hartree-Fock wavefunction for O^{6+}. A=27.116 026 573 138 986 635 766 935 048 422

O^{6+}	
Term	Coefficient
L(0,Ar_1)	15.461 098 939 070 142 806 929 868 645 071
L(1,Ar_1)	$-$4.148 347 900 966 029 782 281 131 240 235 0
L(2,Ar_1)	1.198 415 377 596 299 120 604 788 449 462 9
L(3,Ar_1)	-0.349 949 383 024 926 191 025 658 459 615 72
L(4,Ar_1)	0.101 032 595 411 836 792 987 223 370 990 63
L(5,Ar_1)	-0.299 274 222 935 706 702 951 983 528 387 45$\times 10^{-1}$
L(6,Ar_1)	0.864 438 424 990 373 898 644 997 604 523 43$\times 10^{-2}$
L(7,Ar_1)	-0.257 785 067 401 741 625 116 434 250 071 29$\times 10^{-2}$
L(8,Ar_1)	0.743 184 571 979 597 995 052 081 535 448 30$\times 10^{-3}$
L(9,Ar_1)	-0.223 183 975 898 131 038 722 518 823 728 64$\times 10^{-3}$
L(10,Ar_1)	0.639 913 058 129 944 390 593 718 286 754 52$\times 10^{-4}$
L(11,Ar_1)	-0.193 960 916 942 228 493 134 436 480 532 36$\times 10^{-4}$
L(12,Ar_1)	0.551 711 895 765 577 226 082 541 743 567 33$\times 10^{-5}$
L(13,Ar_1)	-0.168 566 487 463 158 898 160 155 244 058 73$\times 10^{-5}$
L(14,Ar_1)	0.479 509 267 886 033 275 923 358 921 379 59$\times 10^{-6}$
L(15,Ar_1)	-0.144 329 055 817 258 809 397 208 794 661 08$\times 10^{-6}$
L(16,Ar_1)	0.431 063 860 588 504 292 062 970 155 869 05$\times 10^{-7}$
L(17,Ar_1)	-0.116 797 432 655 275 011 445 543 256 846 12$\times 10^{-7}$
L(18,Ar_1)	0.407 341 012 034 872 809 950 828 525 493 68$\times 10^{-8}$
L(19,Ar_1)	-0.968 870 327 726 319 348 185 337 958 384 25$\times 10^{-9}$

TABLE XV: Coefficients for the 20-term Hartree-Fock wavefunction for F^{7+}

. A=30.687 730 337 947 467 028 654 802 088 190

F^{7+}	
Term	Coefficient
L(0,Ar_1)	$-18.568\,070\,181\,593\,922\,323\,791\,092\,795\,985$
L(1,Ar_1)	$5.011\,492\,175\,606\,249\,964\,400\,689\,128\,780\,0$
L(2,Ar_1)	$-1.443\,428\,549\,217\,941\,563\,390\,835\,230\,664\,3$
L(3,Ar_1)	$0.419\,883\,232\,188\,846\,910\,123\,908\,320\,413\,04$
L(4,Ar_1)	$-0.120\,879\,692\,097\,864\,095\,779\,290\,139\,170\,07$
L(5,Ar_1)	$0.356\,047\,618\,572\,981\,059\,603\,733\,539\,190\,99\times10^{-1}$
L(6,Ar_1)	$-0.102\,568\,014\,071\,786\,387\,526\,066\,035\,898\,92\times10^{-1}$
L(7,Ar_1)	$0.303\,809\,290\,125\,418\,243\,389\,045\,021\,125\,62\times10^{-2}$
L(8,Ar_1)	$-0.874\,114\,278\,442\,136\,568\,287\,307\,192\,633\,92\times10^{-3}$
L(9,Ar_1)	$0.260\,367\,846\,102\,750\,119\,080\,525\,870\,454\,29\times10^{-3}$
L(10,Ar_1)	$-0.746\,084\,561\,623\,476\,569\,953\,063\,138\,702\,52\times10^{-4}$
L(11,Ar_1)	$0.223\,840\,135\,769\,182\,083\,406\,233\,246\,163\,59\times10^{-4}$
L(12,Ar_1)	$-0.637\,693\,053\,829\,203\,558\,979\,398\,435\,613\,96\times10^{-5}$
L(13,Ar_1)	$0.192\,400\,844\,718\,447\,763\,985\,338\,338\,833\,62\times10^{-5}$
L(14,Ar_1)	$-0.548\,949\,294\,272\,053\,306\,422\,490\,833\,055\,68\times10^{-6}$
L(15,Ar_1)	$0.163\,269\,853\,172\,839\,484\,105\,548\,764\,611\,14\times10^{-6}$
L(16,Ar_1)	$-0.486\,100\,752\,105\,016\,864\,384\,503\,338\,128\,18\times10^{-7}$
L(17,Ar_1)	$0.132\,396\,210\,119\,947\,596\,685\,550\,341\,734\,44\times10^{-7}$
L(18,Ar_1)	$-0.445\,841\,282\,453\,595\,037\,785\,995\,664\,346\,94\times10^{-8}$
L(19,Ar_1)	$0.112\,514\,422\,258\,346\,506\,445\,500\,381\,533\,43\times10^{-8}$

TABLE XVI: Coefficients for the 20-term Hartree-Fock wavefunction for Ne^{8+}. A=34.255 180 359 638 157 743 450 277 068 075

Ne^{8+}	
Term	Coefficient
L(0,Ar_1)	−21.858 100 328 093 564 072 321 794 752 616
L(1,Ar_1)	5.925 778 817 472 687 028 943 007 970 495 6
L(2,Ar_1)	−1.702 472 339 740 787 489 163 662 830 725 2
L(3,Ar_1)	0.493 624 084 752 163 824 215 448 149 024 65
L(4,Ar_1)	-0.141 765 289 830 325 778 792 983 364 755 53
L(5,Ar_1)	$0.415\,624\,779\,423\,237\,870\,411\,542\,082\,416\,87\times10^{-1}$
L(6,Ar_1)	$-0.119\,450\,580\,197\,929\,696\,162\,046\,521\,742\,33\times10^{-1}$
L(7,Ar_1)	$0.351\,885\,923\,308\,847\,058\,074\,609\,583\,481\,87\times10^{-2}$
L(8,Ar_1)	$-0.101\,051\,625\,120\,283\,465\,469\,015\,866\,128\,45\times10^{-2}$
L(9,Ar_1)	$0.299\,055\,462\,132\,371\,516\,549\,270\,517\,453\,48\times10^{-3}$
L(10,Ar_1)	$-0.856\,143\,021\,547\,533\,114\,111\,498\,389\,305\,28\times10^{-4}$
L(11,Ar_1)	$0.254\,838\,166\,471\,456\,268\,034\,029\,194\,704\,73\times10^{-4}$
L(12,Ar_1)	$-0.726\,358\,269\,070\,162\,874\,402\,346\,947\,196\,13\times10^{-5}$
L(13,Ar_1)	$0.217\,101\,790\,820\,213\,537\,587\,357\,849\,064\,53\times10^{-5}$
L(14,Ar_1)	$-0.620\,149\,460\,616\,339\,318\,125\,458\,656\,011\,66\times10^{-6}$
L(15,Ar_1)	$0.182\,918\,734\,471\,804\,202\,219\,414\,832\,929\,03\times10^{-6}$
L(16,Ar_1)	$-0.542\,278\,326\,921\,942\,295\,487\,929\,681\,213\,22\times10^{-7}$
L(17,Ar_1)	$0.148\,541\,756\,106\,212\,533\,625\,777\,413\,129\,75\times10^{-7}$
L(18,Ar_1)	$-0.485\,481\,798\,009\,915\,230\,858\,719\,034\,671\,77\times10^{-8}$
L(19,Ar_1)	$0.128\,376\,628\,068\,081\,978\,156\,376\,947\,443\,70\times10^{-8}$

TABLE XVII: Coefficients for the 20-term Hartree-Fock wavefunction for Na^{9+}. A=37.818 946 108 463 433 967 395 233 142 163

Na^{9+}	
Term	Coefficient
L(0,Ar_1)	$-25.321\,416\,747\,313\,879\,585\,931\,516\,032\,997$
L(1,Ar_1)	$6.888\,327\,194\,973\,143\,550\,457\,833\,406\,378\,5$
L(2,Ar_1)	$-1.974\,733\,240\,018\,542\,209\,651\,685\,713\,485\,0$
L(3,Ar_1)	$0.570\,950\,567\,485\,904\,404\,005\,801\,800\,523\,52$
L(4,Ar_1)	$-0.163\,627\,927\,741\,987\,773\,823\,733\,418\,705\,24$
L(5,Ar_1)	$0.477\,839\,513\,618\,669\,067\,263\,423\,787\,664\,18\times10^{-1}$
L(6,Ar_1)	$-0.137\,046\,589\,343\,045\,120\,439\,888\,927\,651\,46\times10^{-1}$
L(7,Ar_1)	$0.401\,890\,585\,574\,007\,124\,388\,076\,340\,030\,81\times10^{-2}$
L(8,Ar_1)	$-0.115\,207\,176\,014\,011\,662\,338\,830\,098\,882\,42\times10^{-2}$
L(9,Ar_1)	$0.339\,150\,744\,318\,929\,203\,772\,060\,348\,092\,82\times10^{-3}$
L(10,Ar_1)	$-0.969\,875\,067\,811\,750\,816\,632\,777\,310\,213\,42\times10^{-4}$
L(11,Ar_1)	$0.286\,873\,291\,405\,127\,899\,333\,145\,557\,080\,72\times10^{-4}$
L(12,Ar_1)	$-0.817\,587\,263\,167\,451\,595\,583\,682\,361\,323\,45\times10^{-5}$
L(13,Ar_1)	$0.242\,587\,126\,364\,453\,577\,291\,474\,845\,667\,94\times10^{-5}$
L(14,Ar_1)	$-0.693\,081\,847\,094\,817\,913\,466\,629\,975\,694\,77\times10^{-6}$
L(15,Ar_1)	$0.203\,180\,503\,497\,551\,599\,837\,627\,967\,859\,11\times10^{-6}$
L(16,Ar_1)	$-0.599\,642\,869\,175\,934\,253\,656\,339\,215\,241\,39\times10^{-7}$
L(17,Ar_1)	$0.165\,134\,716\,916\,312\,896\,803\,891\,675\,798\,07\times10^{-7}$
L(18,Ar_1)	$-0.526\,248\,032\,428\,080\,981\,122\,192\,947\,820\,86\times10^{-8}$
L(19,Ar_1)	$0.144\,436\,622\,294\,702\,289\,582\,385\,380\,542\,44\times10^{-8}$

TABLE XVIII: Coefficients for the 20-term Hartree-Fock wavefunction for Mg^{10+}. A=41.379 436 278 138 089 954 159 308 383 702

Mg^{10+}	
Term	Coefficient
L(0,Ar_1)	$-28.949\,651\,188\,019\,149\,598\,098\,892\,099\,912$
L(1,Ar_1)	$7.896\,675\,584\,674\,460\,767\,994\,074\,202\,418\,3$
L(2,Ar_1)	$-2.259\,516\,013\,552\,381\,138\,919\,801\,523\,237\,8$
L(3,Ar_1)	$0.651\,672\,251\,626\,077\,782\,104\,656\,608\,840\,66$
L(4,Ar_1)	$-0.186\,414\,568\,469\,602\,866\,642\,091\,209\,769\,61$
L(5,Ar_1)	$0.542\,547\,410\,316\,383\,751\,383\,547\,544\,166\,23\times10^{-1}$
L(6,Ar_1)	$-0.155\,316\,636\,575\,621\,313\,454\,017\,467\,994\,83\times10^{-1}$
L(7,Ar_1)	$0.453\,714\,116\,495\,336\,974\,883\,429\,025\,298\,70\times10^{-2}$
L(8,Ar_1)	$-0.129\,849\,449\,307\,146\,033\,716\,672\,780\,036\,74\times10^{-2}$
L(9,Ar_1)	$0.380\,569\,332\,911\,959\,730\,816\,139\,548\,910\,79\times10^{-3}$
L(10,Ar_1)	$-0.108\,708\,003\,507\,056\,557\,416\,592\,253\,604\,26\times10^{-3}$
L(11,Ar_1)	$0.319\,875\,739\,900\,759\,707\,008\,057\,675\,521\,38\times10^{-4}$
L(12,Ar_1)	$-0.911\,251\,714\,581\,300\,705\,777\,310\,990\,208\,63\times10^{-5}$
L(13,Ar_1)	$0.268\,791\,582\,761\,681\,925\,769\,959\,895\,082\,89\times10^{-5}$
L(14,Ar_1)	$-0.767\,683\,768\,033\,052\,507\,873\,102\,151\,017\,87\times10^{-6}$
L(15,Ar_1)	$0.223\,986\,873\,430\,920\,038\,128\,830\,816\,165\,78\times10^{-6}$
L(16,Ar_1)	$-0.658\,177\,121\,732\,027\,016\,001\,131\,964\,990\,35\times10^{-7}$
L(17,Ar_1)	$0.182\,111\,099\,667\,650\,500\,727\,286\,170\,823\,15\times10^{-7}$
L(18,Ar_1)	$-0.568\,074\,488\,419\,576\,985\,628\,529\,337\,778\,59\times10^{-8}$
L(19,Ar_1)	$0.160\,675\,103\,142\,394\,731\,959\,725\,216\,668\,41\times10^{-8}$

TABLE XIX: Coefficients for the 20-term Hartree-Fock wavefunction for Al^{11+}. A=44.936 964 386 059 095 203 207 464 248 807

Al^{11+}	
Term	Coefficient
L(0,Ar_1)	−25.321 416 747 313 879 585 931 516 032 997
L(1,Ar_1)	6.888 327 194 973 143 550 457 833 406 378 5
L(2,Ar_1)	−1.974 733 240 018 542 209 651 685 713 485 0
L(3,Ar_1)	0.570 950 567 485 904 404 005 801 800 523 52
L(4,Ar_1)	-0.163 627 927 741 987 773 823 733 418 705 24
L(5,Ar_1)	$0.477\,839\,513\,618\,669\,067\,263\,423\,787\,664\,18\times10^{-1}$
L(6,Ar_1)	$-0.137\,046\,589\,343\,045\,120\,439\,888\,927\,651\,46\times10^{-1}$
L(7,Ar_1)	$0.401\,890\,585\,574\,007\,124\,388\,076\,340\,030\,81\times10^{-2}$
L(8,Ar_1)	$-0.115\,207\,176\,014\,011\,662\,338\,830\,098\,882\,42\times10^{-2}$
L(9,Ar_1)	$0.339\,150\,744\,318\,929\,203\,772\,060\,348\,092\,82\times10^{-3}$
L(10,Ar_1)	$-0.969\,875\,067\,811\,750\,816\,632\,777\,310\,213\,42\times10^{-4}$
L(11,Ar_1)	$0.286\,873\,291\,405\,127\,899\,333\,145\,557\,080\,72\times10^{-4}$
L(12,Ar_1)	$-0.817\,587\,263\,167\,451\,595\,583\,682\,361\,323\,45\times10^{-5}$
L(13,Ar_1)	$0.242\,587\,126\,364\,453\,577\,291\,474\,845\,667\,94\times10^{-5}$
L(14,Ar_1)	$-0.693\,081\,847\,094\,817\,913\,466\,629\,975\,694\,77\times10^{-6}$
L(15,Ar_1)	$0.203\,180\,503\,497\,551\,599\,837\,627\,967\,859\,11\times10^{-6}$
L(16,Ar_1)	$-0.599\,642\,869\,175\,934\,253\,656\,339\,215\,241\,39\times10^{-7}$
L(17,Ar_1)	$0.165\,134\,716\,916\,312\,896\,803\,891\,675\,798\,07\times10^{-7}$
L(18,Ar_1)	$-0.526\,248\,032\,428\,080\,981\,122\,192\,947\,820\,86\times10^{-8}$
L(19,Ar_1)	$0.144\,436\,622\,294\,702\,289\,582\,385\,380\,542\,44\times10^{-8}$

TABLE XX: Coefficients for the 20-term Hartree-Fock wavefunction for Si^{12+}. A=48.491 782 189 978 830 516 281 507 184 295

Si^{12+}	
Term	Coefficient
L(0,Ar_1)	−28.949 651 188 019 149 598 098 892 099 912
L(1,Ar_1)	7.896 675 584 674 460 767 994 074 202 418 3
L(2,Ar_1)	−2.259 516 013 552 381 138 919 801 523 237 8
L(3,Ar_1)	0.651 672 251 626 077 782 104 656 608 840 66
L(4,Ar_1)	-0.186 414 568 469 602 866 642 091 209 769 61
L(5,Ar_1)	$0.542\,547\,410\,316\,383\,751\,383\,547\,544\,166\,23\times10^{-1}$
L(6,Ar_1)	$-0.155\,316\,636\,575\,621\,313\,454\,017\,467\,994\,83\times10^{-1}$
L(7,Ar_1)	$0.453\,714\,116\,495\,336\,974\,883\,429\,025\,298\,70\times10^{-2}$
L(8,Ar_1)	$-0.129\,849\,449\,307\,146\,033\,716\,672\,780\,036\,74\times10^{-2}$
L(9,Ar_1)	$0.380\,569\,332\,911\,959\,730\,816\,139\,548\,910\,79\times10^{-3}$
L(10,Ar_1)	$-0.108\,708\,003\,507\,056\,557\,416\,592\,253\,604\,26\times10^{-3}$
L(11,Ar_1)	$0.319\,875\,739\,900\,759\,707\,008\,057\,675\,521\,38\times10^{-4}$
L(12,Ar_1)	$-0.911\,251\,714\,581\,300\,705\,777\,310\,990\,208\,63\times10^{-5}$
L(13,Ar_1)	$0.268\,791\,582\,761\,681\,925\,769\,959\,895\,082\,89\times10^{-5}$
L(14,Ar_1)	$-0.767\,683\,768\,033\,052\,507\,873\,102\,151\,017\,87\times10^{-6}$
L(15,Ar_1)	$0.223\,986\,873\,430\,920\,038\,128\,830\,816\,165\,78\times10^{-6}$
L(16,Ar_1)	$-0.658\,177\,121\,732\,027\,016\,001\,131\,964\,990\,35\times10^{-7}$
L(17,Ar_1)	$0.182\,111\,099\,667\,650\,500\,727\,286\,170\,823\,15\times10^{-7}$
L(18,Ar_1)	$-0.568\,074\,488\,419\,576\,985\,628\,529\,337\,778\,59\times10^{-8}$
L(19,Ar_1)	$0.160\,675\,103\,142\,394\,731\,959\,725\,216\,668\,41\times10^{-8}$

TABLE XXI: Coefficients for the 20-term Hartree-Fock wavefunction for P^{13+}. A=52.044 096 824 733 857 896 265 301 003 795

P^{13+}	
Term	Coefficient
L(0,Ar_1)	−32.735 534 751 018 556 311 059 601 469 355
L(1,Ar_1)	8.948 691 920 505 440 440 827 391 511 786 8
L(2,Ar_1)	−2.556 218 997 237 334 841 895 707 657 626 6
L(3,Ar_1)	0.735 623 729 946 248 066 473 942 709 978 77
L(4,Ar_1)	-0.210 079 090 861 765 271 038 808 815 593 25
L(5,Ar_1)	$0.609\,622\,434\,381\,875\,365\,484\,590\,992\,076\,50\times10^{-1}$
L(6,Ar_1)	$-0.174\,226\,176\,956\,380\,548\,726\,615\,379\,220\,42\times10^{-1}$
L(7,Ar_1)	$0.507\,260\,878\,565\,643\,002\,273\,629\,026\,481\,44\times10^{-2}$
L(8,Ar_1)	$-0.144\,953\,037\,976\,489\,827\,255\,838\,793\,338\,98\times10^{-2}$
L(9,Ar_1)	$0.423\,237\,540\,890\,514\,551\,836\,578\,518\,229\,61\times10^{-3}$
L(10,Ar_1)	$-0.120\,757\,591\,491\,508\,362\,926\,587\,252\,691\,53\times10^{-3}$
L(11,Ar_1)	$0.353\,785\,856\,401\,731\,447\,420\,534\,594\,073\,97\times10^{-4}$
L(12,Ar_1)	$-0.100\,722\,869\,757\,098\,207\,585\,997\,409\,899\,54\times10^{-4}$
L(13,Ar_1)	$0.295\,662\,159\,362\,409\,348\,780\,925\,907\,764\,66\times10^{-5}$
L(14,Ar_1)	$-0.843\,882\,619\,170\,553\,654\,581\,218\,120\,568\,34\times10^{-6}$
L(15,Ar_1)	$0.245\,286\,480\,141\,000\,882\,355\,688\,425\,568\,17\times10^{-6}$
L(16,Ar_1)	$-0.717\,839\,980\,366\,540\,766\,025\,105\,788\,999\,50\times10^{-7}$
L(17,Ar_1)	$0.199\,426\,729\,216\,124\,224\,117\,895\,839\,474\,22\times10^{-7}$
L(18,Ar_1)	$-0.610\,884\,676\,385\,814\,661\,736\,549\,235\,720\,19\times10^{-8}$
L(19,Ar_1)	$0.177\,080\,648\,950\,003\,614\,558\,064\,739\,374\,52\times10^{-8}$

TABLE XXII: Coefficients for the 20-term Hartree-Fock wavefunction for S^{14+}. A= 55.594 081 349 999 748 774 449 467 667 271

S^{14+}	
Term	Coefficient
L(0,Ar_1)	−36.672 677 523 610 783 013 736 803 062 317
L(1,Ar_1)	10.042 507 983 876 986 941 675 893 012 661
L(2,Ar_1)	−2.864 315 598 768 448 277 392 447 851 859 4
L(3,Ar_1)	0.822 659 928 441 231 955 263 602 021 013 79
L(4,Ar_1)	-0.234 581 038 054 038 093 172 476 446 286 35
L(5,Ar_1)	$0.678\,953\,817\,790\,612\,425\,513\,936\,569\,730\,42\times10^{-1}$
L(6,Ar_1)	$-0.193\,744\,779\,881\,045\,260\,181\,093\,913\,615\,27\times10^{-1}$
L(7,Ar_1)	$0.562\,446\,733\,433\,975\,474\,289\,843\,557\,532\,91\times10^{-2}$
L(8,Ar_1)	$-0.160\,495\,418\,785\,033\,670\,784\,463\,450\,584\,84\times10^{-2}$
L(9,Ar_1)	$0.467\,090\,804\,034\,095\,673\,864\,212\,002\,235\,89\times10^{-3}$
L(10,Ar_1)	$-0.133\,119\,950\,343\,943\,735\,046\,256\,863\,639\,04\times10^{-3}$
L(11,Ar_1)	$0.388\,552\,242\,935\,589\,654\,487\,560\,859\,563\,01\times10^{-4}$
L(12,Ar_1)	$-0.110\,540\,484\,981\,128\,479\,566\,993\,981\,549\,68\times10^{-4}$
L(13,Ar_1)	$0.323\,154\,916\,948\,010\,424\,135\,809\,078\,026\,23\times10^{-5}$
L(14,Ar_1)	$-0.921\,605\,677\,438\,188\,500\,676\,299\,266\,003\,51\times10^{-6}$
L(15,Ar_1)	$0.267\,039\,187\,517\,604\,742\,529\,512\,896\,076\,92\times10^{-6}$
L(16,Ar_1)	$-0.778\,582\,753\,517\,235\,842\,475\,704\,847\,769\,46\times10^{-7}$
L(17,Ar_1)	$0.217\,049\,347\,003\,822\,633\,188\,169\,101\,660\,67\times10^{-7}$
L(18,Ar_1)	$-0.654\,604\,864\,734\,681\,871\,348\,398\,313\,103\,20\times10^{-8}$
L(19,Ar_1)	$0.193\,645\,603\,421\,689\,931\,597\,032\,156\,891\,59\times10^{-8}$

TABLE XXIII: Coefficients for the 20-term Hartree-Fock wavefunction for Cl^{15+}. A= 59.141 885 214 911 497 966 008 396 597 406

Cl^{15+}	
Term	Coefficient
L(0,Ar_1)	−40.755 404 706 676 768 082 455 805 553 109
L(1,Ar_1)	11.176 469 420 950 459 635 082 885 909 912
L(2,Ar_1)	−3.183 339 972 371 237 394 573 592 266 528 2
L(3,Ar_1)	0.912 652 310 029 359 461 842 089 244 429 80
L(4,Ar_1)	-0.259 884 565 079 678 681 531 117 166 832 27
L(5,Ar_1)	$0.750\,443\,282\,598\,373\,816\,794\,097\,803\,776\,39\times10^{-1}$
L(6,Ar_1)	$-0.213\,845\,402\,230\,616\,254\,429\,252\,036\,706\,36\times10^{-1}$
L(7,Ar_1)	$0.619\,196\,985\,538\,507\,768\,509\,481\,551\,555\,59\times10^{-2}$
L(8,Ar_1)	$-0.176\,456\,487\,060\,568\,271\,455\,009\,218\,572\,55\times10^{-2}$
L(9,Ar_1)	$0.512\,071\,983\,210\,340\,625\,641\,247\,720\,288\,31\times10^{-3}$
L(10,Ar_1)	$-0.145\,780\,400\,147\,949\,486\,326\,288\,479\,409\,98\times10^{-3}$
L(11,Ar_1)	$0.424\,129\,973\,498\,651\,766\,715\,163\,488\,474\,22\times10^{-4}$
L(12,Ar_1)	$-0.120\,567\,637\,625\,518\,760\,298\,919\,671\,074\,94\times10^{-4}$
L(13,Ar_1)	$0.351\,232\,539\,146\,106\,542\,700\,302\,170\,027\,15\times10^{-5}$
L(14,Ar_1)	$-0.100\,078\,319\,928\,023\,298\,153\,046\,862\,702\,37\times10^{-5}$
L(15,Ar_1)	$0.289\,212\,437\,944\,389\,043\,938\,368\,777\,031\,50\times10^{-6}$
L(16,Ar_1)	$-0.840\,355\,361\,187\,612\,371\,784\,609\,621\,232\,90\times10^{-7}$
L(17,Ar_1)	$0.234\,954\,082\,533\,585\,648\,808\,718\,685\,923\,87\times10^{-7}$
L(18,Ar_1)	$-0.699\,167\,761\,824\,947\,735\,982\,358\,706\,750\,90\times10^{-8}$
L(19,Ar_1)	$0.210\,363\,925\,105\,509\,964\,170\,500\,080\,397\,16\times10^{-8}$

TABLE XXIV: Coefficients for the 20-term Hartree-Fock wavefunction for Ar^{16+}. A= 62.687 637 750 610 885 097 219 518 715 941

Ar^{16+}	
Term	Coefficient
L(0,Ar_1)	$-44.978\,632\,319\,529\,997\,241\,916\,776\,174\,787$
L(1,Ar_1)	$12.349\,097\,700\,021\,795\,671\,793\,320\,023\,152$
L(2,Ar_1)	$-3.512\,876\,072\,965\,265\,383\,553\,904\,803\,882\,6$
L(3,Ar_1)	$1.005\,485\,924\,000\,801\,246\,626\,446\,894\,396\,2$
L(4,Ar_1)	$-0.285\,957\,612\,500\,160\,441\,141\,584\,289\,822\,46$
L(5,Ar_1)	$0.824\,002\,819\,023\,339\,953\,824\,380\,519\,858\,30\times10^{-1}$
L(6,Ar_1)	$-0.234\,503\,792\,429\,945\,735\,116\,688\,441\,101\,97\times10^{-1}$
L(7,Ar_1)	$0.677\,444\,689\,238\,559\,763\,378\,989\,253\,816\,43\times10^{-2}$
L(8,Ar_1)	$-0.192\,818\,145\,982\,334\,223\,292\,992\,107\,227\,66\times10^{-2}$
L(9,Ar_1)	$0.558\,129\,966\,204\,502\,521\,086\,667\,441\,793\,55\times10^{-3}$
L(10,Ar_1)	$-0.158\,725\,647\,094\,391\,482\,220\,570\,111\,302\,52\times10^{-3}$
L(11,Ar_1)	$0.460\,479\,213\,809\,218\,876\,245\,608\,651\,191\,98\times10^{-4}$
L(12,Ar_1)	$-0.130\,794\,807\,500\,283\,213\,765\,021\,903\,171\,65\times10^{-4}$
L(13,Ar_1)	$0.379\,862\,639\,084\,925\,837\,125\,480\,504\,566\,53\times10^{-5}$
L(14,Ar_1)	$-0.108\,134\,929\,319\,710\,106\,830\,661\,771\,665\,00\times10^{-5}$
L(15,Ar_1)	$0.311\,778\,952\,589\,296\,891\,954\,771\,580\,262\,33\times10^{-6}$
L(16,Ar_1)	$-0.903\,108\,806\,342\,949\,965\,174\,201\,597\,126\,75\times10^{-7}$
L(17,Ar_1)	$0.253\,120\,835\,517\,895\,531\,553\,072\,496\,623\,67\times10^{-7}$
L(18,Ar_1)	$-0.744\,512\,970\,194\,694\,691\,406\,522\,296\,754\,61\times10^{-8}$
L(19,Ar_1)	$0.227\,230\,216\,154\,213\,941\,718\,691\,518\,928\,38\times10^{-8}$