Extended analysis of the spectrum of doubly ionized gold (Au III)

Physica Scripta. Vol. 53, 174–196, 1996

Extended Analysis of the Spectrum of Doubly Ionized Gold (Au III)

J.-F. Wyart,[1,2] Y. N. Joshi,[2] L. Tchang-Brillet[3] and A. J. J. Raassen[4]

[1] Laboratoire Aimé Cotton, CNRS II, Bât.505, Centre Universitaire, 91405-Orsay, France
[2] Physics Department, St. Francis Xavier University, Box 5000, Antigonish, Nova Scotia, Canada B2G 2W5
[3] Department of Atomic and Molecular Astrophysics, Observatoire de Paris-Meudon, 92190-Meudon, France
[4] van der Waals-Zeeman Laboratorium, Universiteit van Amsterdam, Valckenierstraat 65, Amsterdam 1018-XE, The Netherlands

Received November, 21, 1994; accepted in revised form July 13, 1995

Abstract

The spark spectrum of gold was photographed in the 540–2080 Å region on 10.7 m and 3 m normal incidence spectrographs. The number of classified lines for Au III was increased from 295 to 1040 and 134 new levels were added to the 62 levels of the early analysis. They belong to the doubly excited configurations $5d^76s^2$ and $5d^76s6p$ and to the mixed group $5d^8(6d + 7s)$. Parametric calculations satisfactorily explain the experimental energies. Theoretical transition probabilities are reported for selected strong transitions.

1. Introduction and experiment

The observations of the spectra of chemically peculiar stars from the Goddard High Resolution Spectrograph (GHRS) on board the Hubble Space Telescope (HST) have resulted in the identification of lines belonging to some of the 5d-subshell ions including Au II and Au III [1]. This has revived the interest in gold spectra and other spectra of the platinum group which are under investigation in our laboratories. The spectrum of doubly-ionized gold was first described by Iglesias [2] who classified 256 lines in the 750–3310 Å region as transitions between the three lowest configurations $5d^9$, $5d^86s$ and $5d^86p$. She latter [3] revised three levels of the $5d^86p$ configuration on the basis of theoretical predictions of Shadmi [4] and classified ten additional lines. Ehrhardt and Davis [5] remeasured the gold spectrum and gave 27 additional classified lines in the 800–1760 Å region but did not revise any of Iglesias's levels. Wavelength disagreements as large as 0.050 Å were noticed between [1] and [4], which is far beyond the present needs for astrophysics. During their investigation of the Hg IV spectrum Joshi *et al.* [6] carried out least-squares-fitting (LSF) parametric calculations of the $5d^86p$ configuration of Au III and pointed out large deviations between some experimental and calculated levels. In the isoelectronic sequence of Ir I, the spectra of Pt II [7, 8], Hg IV [6, 9] Tl V [10, 11], Pb VI [10, 12] and Bi VII [10, 13] have been investigated in our laboratories in the last few years. In all of these spectra the $5d^9$, $5d^86s$ and $5d^86p$ configurations are almost completely known. In Pt II, only three levels of $5d^76s^2$ are still missing and many levels of $5d^7$ 6s6p, $5d^86d$ and $5d^87s$ have been identified. The present investigation was undertaken to extend the knowledge of the Au III spectrum to the same excited configurations as in Pt II and to derive transition probabilities from a theoretical study of mixed configurations.

The spectra of gold were photographed in the 540–2080 Å region on a 10.7 m normal incidence spectrograph at the NIST laboratory in Gaithersburg (USA) and on a 3 m normal incidence spectrograph at the Antigonish laboratory. The source used at the NIST laboratory was a sliding spark whereas that at the Antigonish laboratory was a triggered spark. Further experimental details are given in our earlier papers [14, 15]. The gold spectrograms were measured by means of semi-automatic comparators either at Observatoire de Paris, Meudon or at the University of New Brunswick (Canada). The reference lines used were the internal standards of C, O, N, Al and Si [16], and a second order polynomial leads to wavelength uncertainties of ± 0.007 Å. The internal consistency of the line list was already checked during the Au IV study [15], and has been confirmed in the present investigation too as unperturbed strongest lines show an average deviation of less than 0.003 Å from their calculated value (see Table I). The wavelengths reported in Table I are in a better agreement with the early values of [1, 3] than with [5]. The intensities of the lines in Table I are in arbitrary units. They were determined in the densitometer processing of four different plates and are not consistent over the entire wavelength region. Thus, comparing intensities of the lines in widely different regions is not meaningful. The energy levels which classify the lines are collected in Tables II (low even levels), III (odd parity levels) and IV (upper even levels) with selected results of the theoretical studies.

2. Results and discussion

2.1. *The configurations* $5d^76s6p$ *and* $5d^76s^2$

On the spectral plates taken at NIST, the strongest features are the classified Au III lines and this material was obviously suitable for extending the analysis. The work in progress on Au II [17] and the recent results on Au IV [14] helped in the discrimination of Au III lines, most of which were still uninterpreted. The Cowan computer codes [18] were used to calculate the energy levels and transition probabilities of the mixed configurations $5d^9 + 5d^86s + 5d^76s^2$ and $5d^86p + 5d^76s6p + 5d^66s^26p + 5d^87p + 5d^85f$. Recent investigations in the neighbouring spectra of Hg III [19] and Pt II [20] helped for scaling energy parameters provided by the HXR method. Semi-empirical comparisons between the lowest levels of the configurations in the third spectra of 5d-elements were used also for improving the average energies of the configurations. In particular, the prediction of $5d^76s^2\,{}^4F_{9/2}$ at $78\,500 \pm 1500\,\mathrm{cm}^{-1}$ [21] is confirmed now, the doubly-excited configurations having their lowest level at $79\,313.52\,\mathrm{cm}^{-1}$. Seventy levels of $5d^76s6p$ are

presently known and the lowest one (125 584.29 cm^{-1}) is located far below the two levels reported in [1] (156 533.06 and 158 324.83 cm^{-1}) which were confirmed in the present work. Most of the lines with apparent Au III character in the wavelength region of the $5d^8 6s$–$5d^7 6s6p$ transitions are now classified and the present data would not allow to find odd parity levels above 180 000 cm^{-1}. The search for $5d^7 6s^2$–$5d^7 6s6p$ transitions led to seven levels of the lower configuration. The wavelength range of this array overlaps those of the 6p–6d and 6p–7s transitions described below, as well as strong Au II and Au IV arrays. The last missing level below 100 000 cm^{-1} is $5d^8 6s\ ^2S_{1/2}$ which has few transitions in complex spectral regions. The calculated transition probabilities show that the $5d^7 6s^2$ levels above 100 000 cm^{-1} have their strongest transitions to the unknown upper levels of $5d^7 6s6p$ and therefore they have not yet been located.

Fitted energy parameters describe the 112 known odd levels with an average deviation of 176 cm^{-1}. The averaged deviations $E_{exp} - E_{calc}$ for the 43 known levels of $5d^8 6p$ are 287 cm^{-1} in the crude approximation of an isolated configuration [6]. Although $5d^8 6p$ has a limited overlap with $5d^7 6s6p$ and no overlap with $5d^8 7p$, $5d^8 5f$ and $5d^6 6s^2 6p$, these averaged deviations drop to 121 cm^{-1} when the same Hamiltonian operator is developed on the extended basis of the five configurations. It is noticed also in Table III that, except for the unknown $(^1S)^2P$ term, the configuration purity of the $5d^8 6p$ levels is larger than 92.0% for any level and its average is 96.2%.

The configuration mixing within the low even group ($5d^9 + 5d^8 6s + 5d^7 6s^2$) had been discussed in [22]. This theoretical study has been resumed by adding the experimental values of $5d^7\ 6s^2$ levels in the least-squares fit of the parameters. The derived configuration percentages for the various levels are given in Table II.

The fitted Slater and spin-orbit energy parameters are compared with *ab initio* integrals in Table V.

2.2. *The configuration* $5d^8 6d$ *and* $5d^8 7s$

In Tl III [23] and Hg III [19], which are simpler spectra than AuIII, the $5d^N 6p$–$5d^N(6d + 7s)$ classified lines are also among the strongest ones. The wavelengths and transition probabilities of the $5d^8 6p$–$5d^8(6d + 7s)$ array in Au III were also predicted in the HXR approach [18]. The knowledge of the similar system in Pt II [8] and of the $5d^9(6d + 7s)$ in Hg III [18] helped us to scale the *ab initio* integrals involving 6d and 7s electrons in Au III. The parametric studies of $5d^8$ in Au IV [14] provided us with $5d^8$ core parameters. It is known that configuration mixing effects $5d^8$–$5d^7 6s$ are not negligible in Au IV [21, 22] . From the $E_{exp} - E_{cal}$ values reported in Table II, it is clear that $5d^7 6s7s$ and $5d^7 6s6d$ have small effects on the known high even levels.

More than 380 lines have been classified in the $5d^8 6p$–$5d^8(6d + 7s)$ transition array in the 1207–1917 Å wavelength region and they are given in Table I. These transitions represent about 25% of the previously unclassified lines in the region. Due to the overlaps with other arrays, there is an appreciable number of blended lines. These transitions between high levels of Au III might be unobservable in stellar spectra. Nevertheless they were useful for revising the energy values of the $5d^8 6p$ levels. These new levels are interpreted in the framework of the Slater-Racah method by means of 17 parameters with an average deviation of 70 cm^{-1}. The fitted and *ab initio* parameters are compared in Table V. They lead to the deviations $\Delta E = E_{exp} - E_{calc}$ reported in Table IV where the next column gives the leading components of the eigenfunctions. From the last column of this table it is clear that most of the levels are free of strong configuration mixing. In terms of the squared amplitudes, the configuration purity is larger than 90% for 51 out of 60 known levels. The values of the interaction parameters $R^2(5d6d,5d7s)$ and $R^2(5d6d,7s5d)$ and their coefficients in intermediate coupling lead to the estimates of the level shifts pertaining to configuration mixing. The largest deviation (-629 cm^{-1}) occurs for the $5d^8 7s\ ^2P_{1/2}$ level at 183 763 cm^{-1}. Mutual repulsions larger than 200 cm^{-1} also effect $(^2G)\ ^1G$ terms of both configurations. It is seen in Table V that the $R^2(5d6d,5d7s)$ parameter differs greatly from its *ab initio* value; however, the fitted value is quite consistent with results obtained in Pt II [8] and Hg III [19].

There are 23 levels in the $5d^8(6d + 7s)$ system still unknown. Most of these levels decay to the levels of the $5d^8 6p$ configuration by means of two or three weak transitions. In this spectral region there are other unclassified lines for different gold ions and the ionization assignments become somewhat unreliable for very weak lines. Consequently, the unknown levels cannot be established unambiguously.

Throughout this extended analysis of Au III, the comparison of observed intensities and calculated transition probabilities was a good guide in the search for new levels. For plasma diagnostic purposes, we have selected in Table VI the transition probabilities of 176 strong lines (gA larger than $10^8\ s^{-1}$ and energy of the upper level below 125 000 cm^{-1}).

Acknowledgements

J. F. W. wishes to thank St. Francis Xavier University for the Award of James Chair Professorship which helped to finalize this project. Y. N. J. wishes to thank Natural Sciences and Engineering Research Council of Canada (NSERC) for the financial assistance. We are also grateful to our colleagues at NIST laboratory, Gaithersburg, Md (USA) for their hospitality and assistance in photographing gold spectra. The support of a NATO grant is also acknowledged.

References

1. Leckrone, D. S., Johansson, S., Wahlgren, G. M. and Adelman, S. J., Physica Scripta **T47**, 149 (1993).
2. Iglesias, L., J. Res. Nat. Bur. Stand., **64A**, 481 (1960).
3. Iglesias, L., J. Res. Nat. Bur. Stand., **70A**, 465 (1966).
4. Shadmi, Y., J. Res. Nat. Bur. Stand. **69A**, 511 (1965).
5. Ehrhardt, J. C. and Davis, S. P., J. Opt. Soc. Am. **61**, 1342 (1971).
6. Joshi, Y. N., Raassen, A. J. J. and Arcimowicz, B., J. Opt. Soc. Am. **B6**, 534 (1989).
7. Sansonetti, J. E., Reader, J., Sansonetti, C. J. and Acquista, N., J. Res. Nat. Inst. Stand. Tech. **97**, 1 (1992).
8. Blaise, J., Vergès, J., Wyart, J.-F. and Engelman, Jr., R., J. Res. Nat. Inst. Stand. Tech. **97**, 217 (1992).
9. van der Valk, A. A., Raassen, A. J. J., and Joshi, Y. N., J. Opt. Soc. Am. **B7**, 1182 (1990).
10. Raassen, A. J. J., van der Valk, A. A., Joshi, Y. N., Podobedova, L. I. and Ryabtsev, A. N., J. Phys. B: At. Mol. Opt. Phys. **22**, 809 (1989).
11. Raassen, A. J. J. and Joshi, Y. N., J. Phys. B: At. Mol. Opt. Phys. **24**, 921 (1991).
12. Raassen, A. J. J., Joshi, Y. N. and van der Valk, A. A., J. Phys. B: At. Mol. Opt. Phys. **23**, 4441 (1990).

13. Raassen, A. J. J. and Joshi, Y. N., J. Phys. B: At. Mol. Opt. Phys. **25**, 1175 (1992).
14. Joshi, Y. N., Raassen, A. J. J. and van der Valk, A. A., J. Opt. Soc. Am. **B8**, 1372 (1991).
15. Wyart, J.-F., Joshi, Y. N., Raassen, A. J. J., Uylings, P. H. M. and Tchang-Brillet, L., Physica Scripta **50**, 672 (1994).
16. Kelly, R. L., J. Phys. Chem. Ref. Data **16**, 651 (1987).
17. Rosberg, M. Dissertation, University of Lund, Sweden (1995).
18. Cowan, R. D., "The Theory of Atomic Structure and Spectra" (Univ. of California Press, Berkeley 1981) and computer codes.
19. Wyart, J.-F., Raassen, A. J. J., Joshi, Y. N. and Uylings, P. H. M., J. Physique II, **2**, 895 (1992).
20. Wyart, J.-F., Blaise, J. and Joshi, Y. N., Physica Scripta, in press (1995).
21 Wyart, J.-F., Raassen, A. J. J., Uylings, P. H. M. and Joshi, Y. N., Physica Scripta **T47**, 59 (1993).
22. Uylings, P. H. M., Raassen, A. J. J. and Wyart, J.-F., J. Phys. B: At. Mol. Opt. Phys. **26**, 4683 (1993).
23. Gutmann, F. and Crooker, A. M., Can. J. Phys. **51**, 1823 (1973).

Table I. *Classified lines of Au III in the wavelength range 1930–714 Å. In the nine columns are given:* (1) *the experimental wavelength Å,* (2) *the estimated intensity in arbitrary units* (3) *the experimental wavenumber in* cm^{-1}, (4) $\Delta\lambda = \lambda_{exp} - \lambda_{calc}$, λ_{calc} *being derived from the energy levels,* (5) E_{even}, (6) J_{even}, (7) E_{odd}, (8) J_{odd} *and eventually* (9) *a comment:* w, *wide line, probable blend of several transitions,* p, *the measurements is perturbed by a close line,* II, III, IV, *Line blended by a classified Au II, Au III or Au IV line*

1923.218	5	51996.19	0.020	193390.9	3.5	–	141394.2	2.5	
1918.278	60	52130.08	0.003	54133.2	1.5	–	106263.4	1.5	
1917.170	1	52160.21	0.005	180411.0	1.5	–	128250.6	1.5	
1915.503	1	52205.62	0.002	174735.8	2.5	–	122530.1	2.5	
1915.406	1	52208.25	0.005	170769.7	2.5	–	118561.3	1.5	
1912.450	5	52288.95	−0.004	91405.6	2.5	–	143694.4	3.5	
1910.913	20	52331.00	−0.007	90971.3	1.5	–	143302.2	1.5	
1909.085	5	52381.12	−0.002	169273.1	1.5	–	116892.0	1.5	
1907.447	30	52426.09	−0.003	91405.6	2.5	–	143831.6	2.5	
1904.575	10	52505.14	−0.007	167844.9	4.5	–	115339.9	4.5	
1899.401	50	52648.19	−0.001	64243.9	2.5	–	116892.0	1.5	
1891.775	50	52860.42	−0.007	90971.3	1.5	–	143831.6	2.5	
1890.193	20	52904.66	0.028	187795.8	4.5	–	134890.4	3.5	w
1890.028	1	52909.28	−0.009	187862.0	3.5	–	134952.9	2.5	
	Bl	52909.28	0.008	174735.8	2.5	–	121826.3	3.5	
1888.775	2	52944.37	−0.027	180411.0	1.5	–	127467.4	1.5	w
1888.163	2	52961.53	0.010	181474.5	2.5	–	128512.7	2.5	
1880.901	70	53166.00	0.002	57818.5	4.5	–	110984.6	3.5	
1880.242	1	53184.65	0.002	90509.7	3.5	–	143694.4	3.5	
1872.396	10	53407.52	0.028	173435.5	1.5	–	120027.2	2.5	
1871.917	80	53421.16	−0.004	54133.2	1.5	–	107554.3	2.5	
1864.386	80	53636.97	0.000	79313.5	4.5	–	132950.5	3.5	
1861.792	300	53711.70	0.000	35076.9	3.5	–	88788.6	3.5	
1861.299	5	53725.91	0.000	99843.7	4.5	–	153569.6	4.5	
	Bl	53725.91	0.004	181192.8	4.5	–	127466.8	5.5	
1860.479	30	53749.59	−0.004	52059.6	2.5	–	105809.1	3.5	
1850.975	40	54025.59	−0.006	90509.7	3.5	–	144535.1	4.5	
1850.127	200	54050.33	0.002	54133.2	1.5	–	108183.6	0.5	
1849.092	40	54080.59	0.000	64243.9	2.5	–	118324.5	3.5	
1848.836	70	54088.07	0.003	54133.2	1.5	–	108221.4	2.5	
1848.063	30	54110.72	0.026	179879.1	3.5	–	125767.6	2.5	
1846.443	2	54158.18	0.010	99843.7	4.5	–	154002.1	3.5	
1844.887	250	54203.85	−0.002	52059.6	2.5	–	106263.4	1.5	
1843.902	5	54232.82	0.004	186585.7	4.5	–	132352.7	4.5	
1841.788	1	54295.07	0.004	58584.5	3.5	–	112879.7	2.5	
	Bl	54295.07	−0.009	179879.1	3.5	–	125584.3	4.5	
1841.024	20	54317.59	−0.005	64243.9	2.5	–	118561.3	1.5	
1828.013	200	54704.20	−0.003	162925.5	3.5	–	108221.4	2.5	
1827.003	2	54734.44	0.005	180502.2	2.5	–	125767.6	2.5	
1821.804	5	54890.65	0.001	63670.6	1.5	–	118561.3	1.5	
1821.172	300	54909.70	−0.002	49439.0	0.5	–	104348.6	0.5	
1816.048	1	55064.61	−0.001	175091.8	3.5	–	120027.2	2.5	IV
	Bl	55064.61	0.001	180648.9	5.5	–	125584.3	4.5	
1812.875	3	55160.99	0.011	192866.0	1.5	–	137704.7	0.5	
1811.424	1	55205.17	0.009	173766.8	2.5	–	118561.3	1.5	
1809.813	100	55254.34	0.000	54133.2	1.5	–	109387.6	1.5	
1807.413	20	55327.69	−0.004	97677.5	1.5	–	153005.1	1.5	
1806.938	20	55342.23	−0.001	168221.9	1.5	–	112879.7	2.5	
1805.239	300	55394.32	−0.004	40345.9	1.5	–	95740.1	1.5	
1803.825	3	55437.74	0.008	58326.9	0.5	–	113764.9	0.5	
1803.651	20	55443.11	0.000	187795.8	4.5	–	132352.7	4.5	
1801.975	300	55494.66	0.000	52059.6	2.5	–	107554.3	2.5	
1801.514	15	55508.88	−0.022	169273.1	1.5	–	113764.9	0.5	w
	Bl	55508.88	0.012	187862.0	3.5	–	132352.7	4.5	
1800.820	5	55530.27	0.004	99843.7	4.5	–	155374.0	3.5	
1793.759	400	55748.84	0.000	40345.9	1.5	–	96094.7	2.5	
1792.646	150	55783.46	−0.004	64243.9	2.5	–	120027.2	2.5	
1789.194	15	55891.09	−0.006	168770.6	2.5	–	112879.7	2.5	
1788.760	10	55904.65	−0.003	98097.6	2.5	–	154002.1	3.5	
1788.472	15	55913.65	0.001	168793.4	3.5	–	112879.7	2.5	
1786.105	300	55987.76	0.005	45740.6	3.5	–	101728.5	2.5	
1783.919	20	56056.35	0.002	161865.5	4.5	–	105809.1	3.5	
1783.867	20	56057.98	0.003	90509.7	3.5	–	146567.8	4.5	
1780.663	15	56158.86	−0.004	174483.2	3.5	–	118324.5	3.5	
1780.573	100	56161.71	0.002	52059.6	2.5	–	108221.4	2.5	
1780.514	2	56163.56	0.005	183631.1	1.5	–	127467.4	1.5	
1780.173	15	56174.32	0.005	174735.8	2.5	–	118561.3	1.5	
1776.395	150	56293.80	−0.003	49969.7	1.5	–	106263.4	1.5	

Table I. *Continued*

1775.167	600	56332.72	−0.003	35076.9	3.5	–	91409.5	4.5	
1774.419	100	56356.46	0.003	63670.6	1.5	–	120027.2	2.5	
1773.258	1	56393.36	0.000	169273.1	1.5	–	112879.7	2.5	
1772.696	2	56411.24	0.003	174735.8	2.5	–	118324.5	3.5	
1772.194	80	56427.22	0.007	79313.5	4.5	–	135741.0	4.5	
1767.409	200	56580.00	−0.001	45740.6	3.5	–	102320.5	3.5	
1761.944	500	56755.49	−0.003	58584.5	3.5	–	115339.9	4.5	
1761.731	10	56762.35	0.004	99843.7	4.5	–	156606.1	4.5	
1760.879	60	56789.83	−0.001	58584.5	3.5	–	115374.3	2.5	
1760.005	5	56818.03	0.002	187795.8	4.5	–	130977.7	3.5	
1759.803	50	56824.55	−0.005	49439.0	0.5	–	106263.4	1.5	
1758.249	1	56874.77	−0.001	173766.8	2.5	–	116892.0	1.5	
1757.956	40	56884.25	0.000	187862.0	3.5	–	130977.7	3.5	
1756.920	500	56917.45	−0.004	38822.4	2.5	–	95740.1	1.5	
1754.633	2	56991.99	−0.006	98097.6	2.5	–	155089.3	1.5	
1751.720	30	57086.74	0.007	90509.7	3.5	–	147596.7	3.5	
1750.814	120	57116.27	0.005	162925.5	3.5	–	105809.1	3.5	
1750.102	150	57139.70	0.000	58584.5	3.5	–	115724.0	4.5	
1748.587	5	57189.04	0.008	175750.6	1.5	–	118561.3	1.5	
1746.057	700	57271.91	0.012	38822.4	2.5	–	96094.7	2.5	
1745.897	30	57277.15	−0.020	98097.6	2.5	–	155374.0	3.5	
1745.800	1	57280.34	0.005	185531.1	1.5	–	128250.6	1.5	
1745.127	400	57302.42	0.005	44425.9	2.5	–	101728.5	2.5	p
1745.170	Bl	57301.01	−0.003	161865.5	4.5	–	104564.6	4.5	p
1744.494	3	57323.20	0.002	180502.2	2.5	–	123179.0	1.5	
1744.349	400	57327.98	−0.001	52059.6	2.5	–	109387.6	1.5	
1742.009	3	57404.99	−0.002	97677.5	1.5	–	155082.5	2.5	
1739.940	1	57473.23	−0.006	173766.8	2.5	–	116293.7	3.5	
1738.480	600	57521.51	−0.003	57818.5	4.5	–	115339.9	4.5	
1736.679	100	57581.17	0.003	99843.7	4.5	–	157424.9	4.5	
1736.638	150	57582.53	−0.003	64243.9	2.5	–	121826.3	3.5	
1736.567	20	57584.88	−0.009	49969.7	1.5	–	107554.3	2.5	
1733.979	30	57670.83	−0.006	180200.8	2.5	–	122530.1	2.5	
1733.113	200	57699.65	0.002	64243.9	2.5	–	121943.6	1.5	
1732.826	40	57709.20	0.000	58584.5	3.5	–	116293.7	3.5	
1730.517	150	57786.20	−0.004	168770.6	2.5	–	110984.6	3.5	
1728.793	30	57843.81	−0.001	174735.8	2.5	–	116892.0	1.5	
1728.202	50	57863.60	−0.004	183631.1	1.5	–	125767.6	2.5	
	Bl	57863.60	0.021	91405.6	2.5	–	149269.9	2.5	
1727.692	10	57880.68	0.005	180411.0	1.5	–	122530.1	2.5	
1727.407	50	57890.23	−0.007	170769.7	2.5	–	112879.7	2.5	IV
1727.279	600	57894.51	0.002	44425.9	2.5	–	102320.5	3.5	
1726.953	70	57905.45	0.000	57818.5	4.5	–	115724.0	4.5	
1726.711	10	57913.56	−0.013	192866.0	1.5	–	134952.9	2.5	
1726.578	10	57918.02	−0.005	183763.8	0.5	–	125846.0	0.5	w
1725.087	30	57968.10	−0.004	192920.9	2.5	–	134952.9	2.5	
1724.012	20	58004.23	−0.003	180411.0	1.5	–	122406.8	0.5	
1723.232	40	58030.48	0.002	192920.9	2.5	–	134890.4	3.5	w
1719.301	30	58163.18	0.004	176724.6	2.5	–	118561.3	1.5	
1718.522	60	58189.54	−0.002	174483.2	3.5	–	116293.7	3.5	
1717.797	400	58214.11	−0.005	49969.7	1.5	–	108183.6	0.5	
1717.612	300	58220.36	0.006	166442.0	2.5	–	108221.4	2.5	IV
1716.684	200	58251.85	−0.004	49969.7	1.5	–	108221.4	2.5	
1715.670	300	58286.28	−0.001	64243.9	2.5	–	122530.1	2.5	
	Bl	58286.28	−0.007	99843.7	4.5	–	158129.7	5.5	
1715.073	8	58306.56	−0.001	186557.2	2.5	–	128250.6	1.5	
1713.479	100	58360.81	0.003	162925.5	3.5	–	104564.6	4.5	
1713.295	20	58367.07	0.008	174091.3	3.5	–	115724.0	4.5	
1713.074	60	58374.61	−0.005	180200.8	2.5	–	121826.3	3.5	
1712.347	50	58399.39	0.023	176724.6	2.5	–	118324.5	3.5	IV
1711.375	20	58432.56	−0.003	90971.3	1.5	–	149403.8	1.5	
1711.094	50	58442.15	−0.002	174735.8	2.5	–	116293.7	3.5	
1710.118	400	58475.51	−0.009	57818.5	4.5	–	116293.7	3.5	
1707.505	200	58564.98	0.004	58326.9	0.5	–	116892.0	1.5	
1704.276	60	58675.95	−0.002	180502.2	2.5	–	121826.3	3.5	
1703.410	3	58705.78	−0.002	181235.8	3.5	–	122530.1	2.5	
1702.243	200	58746.02	0.013	54133.2	1.5	–	112879.7	2.5	w
	Bl	58746.02	−0.041	49439.0	0.5	–	108183.6	0.5	
1702.095	3	58751.12	0.007	174091.3	3.5	–	115339.9	4.5	
1702.010	1	58754.05	−0.008	98097.6	2.5	–	156851.3	1.5	
1701.855	100	58759.40	−0.005	174483.2	3.5	–	115724.0	4.5	
1699.983	200	58824.13	−0.003	45740.6	3.5	–	104564.6	4.5	
1699.691	5	58834.22	0.004	168221.9	1.5	–	109387.6	1.5	

Table I. *Continued*

1698.963	200	58859.45	0.001	63670.6	1.5	–	122530.1	2.5	
1698.604	200	58871.86	0.001	161865.5	4.5	–	102993.6	5.5	
1697.075	200	58924.91	0.001	52059.6	2.5	–	110984.6	3.5	
1696.777	5	58935.25	−0.005	64243.9	2.5	–	123179.0	1.5	
1696.728	5	58936.97	0.004	187187.8	2.5	–	128250.6	1.5	
1696.585	3	58941.93	−0.007	193832.0	2.5	–	134890.4	3.5	
1694.274	5	59022.33	0.010	187273.3	1.5	–	128250.6	1.5	w
1693.930	800	59034.32	0.009	29754.0	4.5	–	88788.6	3.5	
1692.761	5	59075.07	−0.005	186542.2	0.5	–	127467.4	1.5	
1691.801	30	59108.61	0.007	174483.2	3.5	–	115374.3	2.5	
1691.504	5	59119.00	−0.004	186585.7	4.5	–	127466.8	5.5	
1690.811	5	59143.22	0.001	174483.2	3.5	–	115339.9	4.5	
1684.946	40	59349.07	0.007	187862.0	3.5	–	128512.7	2.5	
1684.596	60	59361.40	0.003	174735.8	2.5	–	115374.3	2.5	
1684.423	10	59367.52	0.009	175091.8	3.5	–	115724.0	4.5	
	Bl	59367.52	−0.029	181192.8	4.5	–	121826.3	3.5	
1683.981	10	59383.08	0.000	168770.6	2.5	–	109387.6	1.5	
1682.996	20	59417.85	0.001	49969.7	1.5	–	109387.6	1.5	
1680.444	8	59508.09	0.006	63670.6	1.5	–	123179.0	1.5	
1679.401	10	59545.06	−0.002	161865.5	4.5	–	102320.5	3.5	w
1677.296	20	59619.78	0.007	191972.7	5.5	–	132352.7	4.5	
1676.965	150	59631.55	0.003	54133.2	1.5	–	113764.9	0.5	
1675.862	20	59670.79	−0.004	173435.5	1.5	–	113764.9	0.5	
1674.553	10	59717.44	0.001	175091.8	3.5	–	115374.3	2.5	IV
1674.469	3	59720.44	−0.001	187187.8	2.5	–	127467.4	1.5	
1673.921	200	59739.99	−0.002	58584.5	3.5	–	118324.5	3.5	IV
1673.258	3	59763.66	−0.004	185531.1	1.5	–	125767.6	2.5	
1672.663	160	59784.91	0.006	170769.7	2.5	–	110984.6	3.5	
1672.033	40	59807.42	0.004	192866.0	1.5	–	133058.5	1.5	
1671.666	1	59820.58	0.006	98097.6	2.5	–	157918.3	3.5	
1671.331	15	59832.56	0.001	176724.6	2.5	–	116892.0	1.5	
1671.179	30	59837.98	0.002	181781.7	1.5	–	121943.6	1.5	
1670.863	60	59849.33	0.005	91405.6	2.5	–	151255.1	3.5	
1670.502	5	59862.26	0.005	192920.9	2.5	–	133058.5	1.5	
1669.855	70	59885.42	0.003	169273.1	1.5	–	109387.6	1.5	
1668.098	400	59948.53	0.001	49439.0	0.5	–	109387.6	1.5	
1666.655	100	60000.43	0.002	168221.9	1.5	–	108221.4	2.5	
1664.769	600	60068.40	0.003	45740.6	3.5	–	105809.1	3.5	
1661.867	30	60173.27	0.008	180200.8	2.5	–	120027.2	2.5	
1660.190	15	60234.08	0.009	58326.9	0.5	–	118561.3	1.5	
1657.580	100	60328.92	0.003	187795.8	4.5	–	127466.8	5.5	
1656.083	40	60383.45	0.009	180411.0	1.5	–	120027.2	2.5	
1653.584	5	60474.70	0.008	180502.2	2.5	–	120027.2	2.5	
1652.733	600	60505.86	0.002	57818.5	4.5	–	118324.5	3.5	
1651.704	3	60543.53	0.012	186311.6	3.5	–	125767.6	2.5	
1651.552	10	60549.12	0.003	168770.6	2.5	–	108221.4	2.5	
1651.364	10	60556.01	−0.005	173435.5	1.5	–	112879.7	2.5	
1650.933	60	60571.81	0.005	168793.4	3.5	–	108221.4	2.5	
1650.037	70	60604.71	0.007	162925.5	3.5	–	102320.5	3.5	
1649.276	30	60632.66	0.006	166442.0	2.5	–	105809.1	3.5	
1645.026	30	60789.33	0.006	186557.2	2.5	–	125767.6	2.5	
1644.679	5	60802.12	0.010	99843.7	4.5	–	160646.1	3.5	
1644.195	250	60820.04	0.002	52059.6	2.5	–	112879.7	2.5	
1642.014	15	60900.83	0.000	90509.7	3.5	–	151410.5	4.5	
1638.870	600	61017.67	0.004	35076.9	3.5	–	96094.7	2.5	
1638.589	50	61028.10	0.002	166837.3	3.5	–	105809.1	3.5	
1638.318	70	61038.22	−0.001	193390.9	3.5	–	132352.7	4.5	
1637.955	120	61051.73	−0.001	169273.1	1.5	–	108221.4	2.5	
1636.634	10	61101.01	−0.001	183631.1	1.5	–	122530.1	2.5	
1634.064	90	61197.10	−0.002	162925.5	3.5	–	101728.5	2.5	
1633.553	70	61216.24	0.003	168770.6	2.5	–	107554.3	2.5	
1633.341	25	61224.20	0.001	183631.1	1.5	–	122406.8	0.5	
1632.893	200	61241.01	0.002	54133.2	1.5	–	115374.3	2.5	
1629.981	3	61350.39	−0.002	176724.6	2.5	–	115374.3	2.5	
1629.808	3	61356.93	0.001	183763.8	0.5	–	122406.8	0.5	
1629.116	500	61382.99	0.004	44425.9	2.5	–	105809.1	3.5	
	Bl	61382.99	−0.010	40345.9	1.5	–	101728.5	2.5	
1627.532	10	61442.72	−0.001	58584.5	3.5	–	120027.2	2.5	
1625.870	3	61505.55	0.004	187273.3	1.5	–	125767.6	2.5	
1625.391	60	61523.65	0.002	64243.9	2.5	–	125767.6	2.5	
1624.988	30	61538.92	0.005	180100.4	0.5	–	118561.3	1.5	
1624.552	150	61555.42	−0.021	179879.1	3.5	–	118324.5	3.5	IV
1623.281	60	61603.62	−0.004	174483.2	3.5	–	112879.7	2.5	

Table I. *Continued*

1622.349	30	61639.00	0.011	180200.8	2.5	–	118561.3	1.5	
1621.917	800	61655.44	0.003	29754.0	4.5	–	91409.5	4.5	
1620.253	80	61718.76	0.001	169273.1	1.5	–	107554.3	2.5	
1617.765	200	61813.69	0.000	45740.6	3.5	–	107554.3	2.5	
1617.143	400	61837.47	0.000	44425.9	2.5	–	106263.4	1.5	
1616.647	2	61856.43	−0.009	174735.8	2.5	–	112879.7	2.5	
1616.151	30	61875.40	−0.011	189342.3	1.5	–	127467.4	1.5	w
	Bl	61875.40	0.024	180200.8	2.5	–	118324.5	3.5	
1614.933	30	61922.07	−0.009	194274.5	4.5	–	132352.7	4.5	w
1614.444	20	61940.82	0.001	180502.2	2.5	–	118561.3	1.5	
1614.386	8	61943.06	0.004	192920.9	2.5	–	130977.7	3.5	
1613.275	30	61985.72	0.001	175750.6	1.5	–	113764.9	0.5	
1611.973	60	62035.76	0.000	167844.9	4.5	–	105809.1	3.5	
1610.390	150	62096.75	0.005	63670.6	1.5	–	125767.6	2.5	
1608.358	100	62175.20	0.003	63670.6	1.5	–	125846.0	0.5	
1608.308	3	62177.13	0.016	180502.2	2.5	–	118324.5	3.5	p
1607.404	80	62212.10	−0.001	175091.8	3.5	–	112879.7	2.5	
1605.842	100	62272.62	0.001	166837.3	3.5	–	104564.6	4.5	
1603.787	8	62352.42	−0.006	185531.1	1.5	–	123179.0	1.5	
1600.491	500	62480.81	0.000	45740.6	3.5	–	108221.4	2.5	
1598.768	120	62548.18	0.003	170769.7	2.5	–	108221.4	2.5	
1594.095	10	62731.50	−0.008	97677.5	1.5	–	160408.7	2.5	
1593.402	400	62758.80	0.000	54133.2	1.5	–	116892.0	1.5	
1593.292	100	62763.15	0.008	167328.1	5.5	–	104564.6	4.5	
1592.807	20	62782.26	−0.001	173766.8	2.5	–	110984.6	3.5	
1590.986	40	62854.12	0.005	193832.0	2.5	–	130977.7	3.5	
1590.621	70	62868.53	−0.005	181192.8	4.5	–	118324.5	3.5	
1590.566	100	62870.69	0.006	175750.6	1.5	–	112879.7	2.5	
1589.670	200	62906.14	−0.001	38822.4	2.5	–	101728.5	2.5	
1589.570	300	62910.09	−0.001	49969.7	1.5	–	112879.7	2.5	
	Bl	62910.09	0.032	181235.8	3.5	–	118324.5	3.5	
1588.272	15	62961.50	0.001	168770.6	2.5	–	105809.1	3.5	
1587.701	100	62984.16	0.003	168793.4	3.5	–	105809.1	3.5	
1587.487	10	62992.66	−0.007	197945.3	2.5	–	134952.9	2.5	
1586.854	60	63017.79	0.003	186196.9	2.5	–	123179.0	1.5	
1585.909	40	63055.33	−0.009	197945.3	2.5	–	134890.4	3.5	IV
1585.394	80	63075.80	0.002	195428.6	5.5	–	132352.7	4.5	
1584.623	80	63106.48	0.006	174091.3	3.5	–	110984.6	3.5	
1584.076	200	63128.29	0.001	44425.9	2.5	–	107554.3	2.5	
1582.065	10	63208.51	−0.003	180100.4	0.5	–	116892.0	1.5	
1581.892	3	63215.42	0.000	170769.7	2.5	–	107554.3	2.5	
1581.775	40	63220.13	0.005	181781.7	1.5	–	118561.3	1.5	
1581.237	100	63241.63	0.004	58584.5	3.5	–	121826.3	3.5	
1580.274	100	63280.17	0.002	167844.9	4.5	–	104564.6	4.5	
1580.000	50	63291.15	0.000	198181.5	3.5	–	134890.4	3.5	IV
1579.870	50	63296.34	0.010	194274.5	4.5	–	130977.7	3.5	
1579.746	50	63301.33	−0.007	179594.8	4.5	–	116293.7	3.5	
1579.556	20	63308.93	−0.005	180200.8	2.5	–	116892.0	1.5	
1579.413	300	63314.68	0.001	52059.6	2.5	–	115374.3	2.5	
1577.856	50	63377.15	0.005	185321.0	1.5	–	121943.6	1.5	w
	Bl	63377.15	0.027	186557.2	2.5	–	123179.0	1.5	
1577.633	20	63386.11	0.000	189153.7	2.5	–	125767.6	2.5	p
1574.988	30	63492.53	−0.003	90509.7	3.5	–	154002.1	3.5	
1574.847	400	63498.22	−0.002	38822.4	2.5	–	102320.5	3.5	
1574.847	400	63498.22	0.010	174483.2	3.5	–	110984.6	3.5	
1572.692	30	63585.25	0.003	179879.1	3.5	–	116293.7	3.5	
1572.568	150	63590.26	0.006	79313.5	4.5	–	142904.0	5.5	
1572.229	5	63603.95	−0.002	183631.1	1.5	–	120027.2	2.5	
1572.148	60	63607.23	0.004	185433.7	3.5	–	121826.3	3.5	
1571.885	150	63617.89	0.000	169427.0	4.5	–	105809.1	3.5	w
	Bl	63617.89	−0.030	58326.9	0.5	–	121943.6	1.5	
1571.300	10	63641.56	0.000	179015.9	1.5	–	115374.3	2.5	
1570.688	100	63666.36	0.009	186196.9	2.5	–	122530.1	2.5	IV
1570.419	20	63677.26	−0.009	91405.6	2.5	–	155082.5	2.5	
1570.260	25	63683.71	0.002	91405.6	2.5	–	155089.3	1.5	
1567.859	100	63781.23	0.005	186311.6	3.5	–	122530.1	2.5	
1567.513	400	63795.33	−0.003	49969.7	1.5	–	113764.9	0.5	
1567.513	400	63795.33	0.003	44425.9	2.5	–	108221.4	2.5	
1566.388	20	63841.15	0.000	90971.3	1.5	–	154812.5	0.5	
1566.300	70	63844.74	0.005	176724.6	2.5	–	112879.7	2.5	
1565.664	70	63870.65	0.004	179594.8	4.5	–	115724.0	4.5	
1565.614	40	63872.72	0.013	168221.9	1.5	–	104348.6	0.5	
1564.772	50	63907.06	0.000	180200.8	2.5	–	116293.7	3.5	

Table I. *Continued*

1563.830	120	63945.58	0.000	58584.5	3.5	–	122530.1	2.5	
1562.424	600	64003.11	−0.009	40345.9	1.5	–	104348.6	0.5	
1562.336	300	64006.72	0.001	64243.9	2.5	–	128250.6	1.5	
	Bl	64006.72	0.026	57818.5	4.5	–	121826.3	3.5	
1561.845	20	64026.82	0.005	186557.2	2.5	–	122530.1	2.5	
1560.562	80	64079.50	0.010	58326.9	0.5	–	122406.8	0.5	
1560.200	80	64094.33	0.001	187273.3	1.5	–	123179.0	1.5	
1559.887	80	64107.21	0.001	175091.8	3.5	–	110984.6	3.5	
1559.791	15	64111.16	−0.001	90971.3	1.5	–	155082.5	2.5	
1559.623	40	64118.05	−0.001	90971.3	1.5	–	155089.3	1.5	
1559.542	5	64121.39	0.001	166442.0	2.5	–	102320.5	3.5	
1559.199	30	64135.50	−0.003	186542.2	0.5	–	122406.8	0.5	
1558.726	40	64154.94	0.005	179879.1	3.5	–	115724.0	4.5	
1557.418	60	64208.84	−0.009	180502.2	2.5	–	116293.7	3.5	
1556.932	150	64228.90	−0.002	168793.5	5.5	–	104564.6	4.5	
1556.804	100	64234.17	−0.001	52059.6	2.5	–	116293.7	3.5	
1555.971	80	64268.56	0.005	64243.9	2.5	–	128512.7	2.5	
1554.568	300	64326.55	−0.016	49439.0	0.5	–	113764.9	0.5	w
1554.374	100	64334.60	−0.004	167328.1	5.5	–	102993.6	5.5	
1553.918	100	64353.45	−0.001	192866.0	1.5	–	128512.7	2.5	
1553.504	5	64370.63	−0.002	186196.9	2.5	–	121826.3	3.5	
1553.256	150	64380.90	0.000	79313.5	4.5	–	143694.4	3.5	
1552.211	2	64424.22	−0.001	99843.7	4.5	–	164267.8	3.5	
1552.115	20	64428.20	−0.003	54133.2	1.5	–	118561.3	1.5	
1551.008	10	64474.22	0.001	99843.7	4.5	–	164317.9	5.5	
1550.749	30	64484.98	0.007	186311.6	3.5	–	121826.3	3.5	
1550.272	50	64504.83	−0.002	179879.1	3.5	–	115374.3	2.5	IV
	Bl	64504.83	0.027	191972.7	5.5	–	127466.8	5.5	
1549.986	5	64516.70	0.001	166837.3	3.5	–	102320.5	3.5	
1548.468	200	64579.98	0.000	63670.6	1.5	–	128250.6	1.5	
1547.658	20	64613.74	−0.004	186557.2	2.5	–	121943.6	1.5	
1547.615	5	64615.57	−0.004	192866.0	1.5	–	128250.6	1.5	
1546.305	40	64670.28	0.000	192920.9	2.5	–	128250.6	1.5	
1544.852	25	64731.10	−0.006	186557.2	2.5	–	121826.3	3.5	
1544.170	100	64759.70	−0.008	186585.7	4.5	–	121826.3	3.5	
1542.579	40	64826.52	−0.002	180200.8	2.5	–	115374.3	2.5	
1542.435	30	64832.57	−0.003	52059.6	2.5	–	116892.0	1.5	
1542.208	120	64842.08	−0.002	63670.6	1.5	–	128512.7	2.5	
1541.969	150	64852.14	−0.003	58326.9	0.5	–	123179.0	1.5	
	Bl	64852.14	−0.021	167844.9	4.5	–	102993.6	5.5	
1541.720	120	64862.61	−0.006	169427.0	4.5	–	104564.6	4.5	
1541.635	40	64866.18	0.007	187273.3	1.5	–	122406.8	0.5	
1541.078	5	64889.63	0.000	181781.7	1.5	–	116892.0	1.5	
1540.837	250	64899.80	−0.017	181192.8	4.5	–	116293.7	3.5	IV
1540.241	150	64924.92	0.001	180648.9	5.5	–	115724.0	4.5	
1539.831	90	64942.20	−0.002	181235.8	3.5	–	116293.7	3.5	
1539.392	90	64960.71	−0.002	170769.7	2.5	–	105809.1	3.5	
	Bl	64960.71	0.021	44425.9	2.5	–	109387.6	1.5	
1537.589	5	65036.88	−0.005	180411.0	1.5	–	115374.3	2.5	
1535.441	90	65127.88	0.000	180502.2	2.5	–	115374.3	2.5	
	Bl	65127.88	−0.009	91405.6	2.5	–	156533.1	3.5	
1534.007	200	65188.76	−0.005	168182.2	6.5	–	102993.6	5.5	
1533.687	70	65202.35	0.003	183763.8	0.5	–	118561.3	1.5	
1533.236	100	65221.53	0.002	79313.5	4.5	–	144535.1	4.5	
1532.705	70	65244.11	−0.003	45740.6	3.5	–	110984.6	3.5	
	Bl	65244.11	0.001	187187.8	2.5	–	121943.6	1.5	
1531.182	10	65309.04	−0.001	180648.9	5.5	–	115339.9	4.5	
1530.931	60	65319.72	−0.008	193832.0	2.5	–	128512.7	2.5	
1530.692	40	65329.94	−0.005	187273.3	1.5	–	121943.6	1.5	
1530.262	10	65348.30	−0.001	174735.8	2.5	–	109387.6	1.5	
1528.940	300	65404.78	−0.003	49969.7	1.5	–	115374.3	2.5	
1527.980	10	65445.90	−0.003	91405.6	2.5	–	156851.3	1.5	
1527.447	60	65468.71	0.004	181192.8	4.5	–	115724.0	4.5	
1526.446	10	65511.64	0.005	181235.8	3.5	–	115724.0	4.5	
1526.152	30	65524.28	0.001	167844.9	4.5	–	102320.5	3.5	
1525.855	15	65537.02	0.005	91405.6	2.5	–	156942.8	2.5	
1525.667	300	65545.09	0.007	173766.8	2.5	–	108221.4	2.5	IV
1523.304	170	65646.80	0.002	193113.7	6.5	–	127466.8	5.5	
1521.141	5	65740.15	−0.002	176724.6	2.5	–	110984.6	3.5	
1519.765	200	65799.64	0.004	168793.5	5.5	–	102993.6	5.5	
1519.023	5	65831.79	0.011	97677.5	1.5	–	163509.8	2.5	
1518.337	170	65861.55	−0.001	181235.8	3.5	–	115374.3	2.5	
1518.151	80	65869.61	0.007	174091.3	3.5	–	108221.4	2.5	

Table I. *Continued*

1517.583	80	65894.24	−0.006	54133.2	1.5	–	120027.2	2.5	p
1517.533	100	65896.44	−0.012	181235.8	3.5	–	115339.9	4.5	p
1517.050	150	65917.41	0.002	40345.9	1.5	–	106263.4	1.5	
1515.851	60	65969.56	−0.001	187795.8	4.5	–	121826.3	3.5	
1515.807	50	65971.46	0.000	90971.3	1.5	–	156942.8	2.5	
1515.711	50	65975.66	−0.020	189153.7	2.5	–	123179.0	1.5	
1512.937	80	66096.62	−0.004	90509.7	3.5	–	156606.1	4.5	
1512.856	90	66100.16	−0.001	181474.5	2.5	–	115374.3	2.5	
1512.031	70	66136.19	0.000	179015.9	1.5	–	112879.7	2.5	
1511.248	30	66170.49	−0.019	186196.9	2.5	–	120027.2	2.5	
	Bl	66170.49	−0.005	98097.6	2.5	–	164267.8	3.5	
1509.094	80	66264.92	−0.001	52059.6	2.5	–	118324.5	3.5	
1508.644	200	66284.68	−0.007	186311.6	3.5	–	120027.2	2.5	
1506.859	80	66363.23	−0.003	175750.6	1.5	–	109387.6	1.5	
1505.854	80	66407.51	−0.004	181781.7	1.5	–	115374.3	2.5	
1505.271	90	66433.23	−0.003	90509.7	3.5	–	156942.8	2.5	
	Bl	66433.23	0.003	169427.0	4.5	–	102993.6	5.5	
1504.889	70	66450.10	0.000	168770.6	2.5	–	102320.5	3.5	
1504.369	200	66473.07	−0.005	168793.4	3.5	–	102320.5	3.5	
1503.912	130	66493.26	0.003	168221.9	1.5	–	101728.5	2.5	
1503.716	500	66501.93	−0.005	52059.6	2.5	–	118561.3	1.5	
1503.482	12	66512.26	0.012	91405.6	2.5	–	157918.3	3.5	
1503.434	30	66514.40	0.000	174735.8	2.5	–	108221.4	2.5	
1503.088	100	66529.72	0.005	186557.2	2.5	–	120027.2	2.5	
1502.438	600	66558.47	0.003	44425.9	2.5	–	110984.6	3.5	
1500.977	120	66623.26	0.008	189153.7	2.5	–	122530.1	2.5	
1500.343	800	66651.43	0.004	35076.9	3.5	–	101728.5	2.5	
1498.489	150	66733.89	−0.001	64243.9	2.5	–	130977.7	3.5	
1498.372	80	66739.09	−0.001	183631.1	1.5	–	116892.0	1.5	
1497.917	350	66759.39	0.006	185321.0	1.5	–	118561.3	1.5	II
1496.831	15	66807.81	−0.003	194274.5	4.5	–	127466.8	5.5	
1496.310	130	66831.06	−0.006	162925.5	3.5	–	96094.7	2.5	
1495.428	80	66870.48	−0.002	175091.8	3.5	–	108221.4	2.5	
1494.271	120	66922.27	0.002	49969.7	1.5	–	116892.0	1.5	
1493.974	2	66935.56	−0.002	189342.3	1.5	–	122406.8	0.5	
1492.536	120	67000.04	−0.006	58584.5	3.5	–	125584.3	4.5	
	Bl	67000.04	−0.015	179879.1	3.5	–	112879.7	2.5	
1491.092	70	67064.96	−0.002	168793.4	3.5	–	101728.5	2.5	
1490.167	150	67106.58	−0.003	169427.0	4.5	–	102320.5	3.5	
1489.442	700	67139.26	−0.003	45740.6	3.5	–	112879.7	2.5	
1488.986	50	67159.80	0.016	187187.8	2.5	–	120027.2	2.5	
1488.472	150	67182.98	0.002	58584.5	3.5	–	125767.6	2.5	
1487.913	900	67208.22	0.004	40345.9	1.5	–	107554.3	2.5	
1487.130	900	67243.61	0.001	35076.9	3.5	–	102320.5	3.5	
1486.897	300	67254.17	0.002	79313.5	4.5	–	146567.8	4.5	
1485.274	25	67327.65	−0.005	189153.7	2.5	–	121826.3	3.5	
1485.067	100	67337.02	0.001	176724.6	2.5	–	109387.6	1.5	
1484.704	60	67353.47	0.000	90971.3	1.5	–	158324.8	2.5	
1482.781	250	67440.85	0.003	38822.4	2.5	–	106263.4	1.5	
1482.513	200	67453.02	0.000	49439.0	0.5	–	116892.0	1.5	
1481.488	60	67499.71	−0.003	97677.5	1.5	–	165177.1	1.5	
1481.068	300	67518.83	0.005	58326.9	0.5	–	125846.0	0.5	
1480.790	150	67531.50	−0.005	180411.0	1.5	–	112879.7	2.5	
1480.661	250	67537.40	0.003	175091.8	3.5	–	107554.3	2.5	
1480.502	200	67544.64	−0.001	169273.1	1.5	–	101728.5	2.5	
1478.804	140	67622.23	0.006	180502.2	2.5	–	112879.7	2.5	
1478.512	60	67635.55	0.000	186196.9	2.5	–	118561.3	1.5	
1477.893	50	67663.90	−0.015	98097.6	2.5	–	165760.8	2.5	
1477.746	100	67670.61	0.000	91405.6	2.5	–	159076.2	3.5	
1475.151	80	67789.68	0.012	99843.7	4.5	–	167633.9	4.5	
1474.700	500	67810.40	0.000	54133.2	1.5	–	121943.6	1.5	
1474.610	100	67814.55	0.013	90509.7	3.5	–	158324.8	2.5	
1474.108	80	67837.62	0.003	40345.9	1.5	–	108183.6	0.5	
1473.286	300	67875.48	0.001	40345.9	1.5	–	108221.4	2.5	
1472.865	30	67894.88	0.014	99843.7	4.5	–	167739.2	5.5	
1471.509	50	67957.46	0.005	173766.8	2.5	–	105809.1	3.5	
1471.417	120	67961.70	0.002	195428.6	5.5	–	127466.8	5.5	
1471.296	500	67967.31	0.006	52059.6	2.5	–	120027.2	2.5	
1466.926	100	68169.75	0.008	98097.6	2.5	–	166267.7	3.5	
1466.356	20	68196.28	0.002	175750.6	1.5	–	107554.3	2.5	
1465.576	20	68232.58	0.003	186557.2	2.5	–	118324.5	3.5	
1465.062	30	68256.51	0.006	183631.1	1.5	–	115374.3	2.5	
1464.963	20	68261.12	0.002	186585.7	4.5	–	118324.5	3.5	

Table I. *Continued*

1464.696	600	68273.53	0.002	54133.2	1.5	–	122406.8	0.5	
1464.483	40	68283.47	−0.007	79313.5	4.5	–	147596.7	3.5	
1462.055	200	68396.88	0.000	54133.2	1.5	–	122530.1	2.5	
1460.937	130	68449.23	−0.001	170769.7	2.5	–	102320.5	3.5	
1460.843	2	68453.61	0.003	44425.9	2.5	–	112879.7	2.5	
1460.441	120	68472.48	−0.001	174735.8	2.5	–	106263.4	1.5	
1458.439	50	68566.46	0.000	90509.7	3.5	–	159076.2	3.5	
1457.892	2	68592.17	−0.011	49969.7	1.5	–	118561.3	1.5	
1457.837	7	68594.80	−0.001	181474.5	2.5	–	112879.7	2.5	
1457.507	30	68610.30	−0.002	179594.8	4.5	–	110984.6	3.5	
1457.164	15	68626.44	0.000	187187.8	2.5	–	118561.3	1.5	
1456.153	40	68674.10	0.000	174483.2	3.5	–	105809.1	3.5	
1455.454	30	68707.06	−0.009	64243.9	2.5	–	132950.5	3.5	
1455.356	1	68711.73	0.006	187273.3	1.5	–	118561.3	1.5	
1454.932	800	68731.73	0.003	38822.4	2.5	–	107554.3	2.5	
1453.178	500	68814.70	−0.002	64243.9	2.5	–	133058.5	1.5	
1452.156	10	68863.13	0.003	187187.8	2.5	–	118324.5	3.5	
1449.204	7	69003.38	−0.004	91405.6	2.5	–	160408.7	2.5	
1448.402	800	69041.59	0.002	40345.9	1.5	–	109387.6	1.5	
	Bl	69041.59	−0.008	170769.7	2.5	–	101728.5	2.5	
1447.461	200	69086.49	0.008	173435.5	1.5	–	104348.6	0.5	
1446.715	300	69122.13	0.004	49439.0	0.5	–	118561.3	1.5	
1445.703	150	69170.48	−0.002	176724.6	2.5	–	107554.3	2.5	
1442.899	10	69304.90	−0.002	186196.9	2.5	–	116892.0	1.5	
1441.174	500	69387.88	−0.001	63670.6	1.5	–	133058.5	1.5	
1440.943	60	69399.02	−0.001	38822.4	2.5	–	108221.4	2.5	
1439.443	150	69471.33	0.000	187795.8	4.5	–	118324.5	3.5	
1439.105	900	69487.61	0.002	35076.9	3.5	–	104564.6	4.5	
1436.800	500	69599.09	0.005	45740.6	3.5	–	115339.9	4.5	
1436.083	600	69633.88	−0.003	45740.6	3.5	–	115374.3	2.5	
1435.789	900	69648.12	0.003	57818.5	4.5	–	127466.8	5.5	
1434.844	300	69693.97	0.015	197945.3	2.5	–	128250.6	1.5	II
1433.348	800	69766.71	0.000	52059.6	2.5	–	121826.3	3.5	
1431.562	20	69853.77	−0.013	98097.6	2.5	–	167950.7	3.5	IV
1430.944	10	69883.92	0.002	52059.6	2.5	–	121943.6	1.5	
1430.632	50	69899.18	−0.003	90509.7	3.5	–	160408.7	2.5	
1430.532	150	69904.05	−0.019	186196.9	2.5	–	116293.7	3.5	w
1430.044	600	69927.92	0.004	58584.5	3.5	–	128512.7	2.5	
1428.911	900	69983.37	0.000	45740.6	3.5	–	115724.0	4.5	
1427.396	600	70057.64	−0.002	49969.7	1.5	–	120027.2	2.5	
1426.645	130	70094.54	−0.016	185433.7	3.5	–	115339.9	4.5	IV
1425.786	15	70136.77	−0.007	90509.7	3.5	–	160646.1	3.5	
1421.741	50	70336.28	−0.007	192866.0	1.5	–	122530.1	2.5	
1420.639	60	70390.85	−0.002	192920.9	2.5	–	122530.1	2.5	
1419.327	300	70455.93	0.001	161865.5	4.5	–	91409.5	4.5	
1419.241	120	70460.18	−0.020	192866.0	1.5	–	122406.8	0.5	w
	Bl	70460.18	0.021	176724.6	2.5	–	106263.4	1.5	
1419.028	400	70470.78	−0.005	52059.6	2.5	–	122530.1	2.5	
1417.373	700	70553.07	0.002	45740.6	3.5	–	116293.7	3.5	
1417.127	700	70565.32	−0.003	38822.4	2.5	–	109387.6	1.5	
1415.497	700	70646.55	−0.001	64243.9	2.5	–	134890.4	3.5	
1414.243	600	70709.19	−0.002	64243.9	2.5	–	134952.9	2.5	
1413.781	900	70732.33	−0.003	35076.9	3.5	–	105809.1	3.5	
1413.567	40	70743.04	−0.009	166837.3	3.5	–	96094.7	2.5	
1412.527	300	70795.12	−0.012	179015.9	1.5	–	108221.4	2.5	IV
1411.821	6	70830.50	−0.025	189153.7	2.5	–	118324.5	3.5	
1410.550	40	70894.33	−0.006	187187.8	2.5	–	116293.7	3.5	
1410.143	200	70914.77	0.015	176724.6	2.5	–	105809.1	3.5	
1409.477	900	70948.32	0.001	44425.9	2.5	–	115374.3	2.5	
1408.894	50	70977.66	−0.007	192920.9	2.5	–	121943.6	1.5	
1406.175	40	71114.91	−0.005	180502.2	2.5	–	109387.6	1.5	
1406.082	200	71119.63	−0.005	52059.6	2.5	–	123179.0	1.5	
1403.575	35	71246.64	−0.018	186585.7	4.5	–	115339.9	4.5	IV
1402.874	450	71282.24	0.001	63670.6	1.5	–	134952.9	2.5	
1400.517	120	71402.21	−0.004	175750.6	1.5	–	104348.6	0.5	
1398.560	100	71502.11	0.000	187795.8	4.5	–	116293.7	3.5	
1398.286	250	71516.13	−0.002	162925.5	3.5	–	91409.5	4.5	
1397.338	5	71564.65	−0.001	193390.9	3.5	–	121826.3	3.5	
1397.139	400	71574.82	0.001	57818.5	4.5	–	129393.4	5.5	
1395.973	800	71634.61	−0.005	54133.2	1.5	–	125767.6	2.5	
1395.522	150	71657.76	−0.001	179879.1	3.5	–	108221.4	2.5	IV
1394.661	120	71701.99	−0.002	90509.7	3.5	–	162211.6	4.5	
1394.567	8	71706.87	0.003	173435.5	1.5	–	101728.5	2.5	

Table I. *Continued*

1394.447	20	71713.00	−0.005	54133.2	1.5	–	125846.0	0.5	
1393.420	200	71765.88	0.007	185531.1	1.5	–	113764.9	0.5	
1393.326	100	71770.70	0.001	174091.3	3.5	–	102320.5	3.5	
1391.443	800	71867.81	−0.001	44425.9	2.5	–	116293.7	3.5	
1389.393	600	71973.87	0.001	49969.7	1.5	–	121943.6	1.5	
1389.283	100	71979.56	−0.004	180200.8	2.5	–	108221.4	2.5	
1388.147	100	72038.45	−0.004	173766.8	2.5	–	101728.5	2.5	
1387.500	25	72072.06	−0.004	187795.8	4.5	–	115724.0	4.5	
1387.018	120	72097.12	−0.002	79313.5	4.5	–	151410.5	4.5	
1386.890	45	72103.80	0.008	91405.6	2.5	–	163509.8	2.5	
1386.434	150	72127.46	−0.005	168221.9	1.5	–	96094.7	2.5	
1386.255	50	72136.82	0.023	187862.0	3.5	–	115724.0	4.5	
1385.768	900	72162.17	0.000	38822.4	2.5	–	110984.6	3.5	
1384.515	30	72227.46	−0.002	180411.0	1.5	–	108183.6	0.5	
1383.840	150	72262.67	−0.019	189153.7	2.5	–	116892.0	1.5	
1383.019	180	72305.61	0.002	91405.6	2.5	–	163711.3	3.5	
	Bl	72305.61	0.012	98097.6	2.5	–	170403.8	1.5	
1382.648	30	72325.00	−0.004	179879.1	3.5	–	107554.3	2.5	
1381.926	50	72362.80	0.000	174091.3	3.5	–	101728.5	2.5	
1381.347	900	72393.12	0.001	58584.5	3.5	–	130977.7	3.5	
1380.925	200	72415.22	0.001	174735.8	2.5	–	102320.5	3.5	
1380.494	500	72437.86	−0.013	49969.7	1.5	–	122406.8	0.5	
1380.254	50	72450.45	−0.003	189342.3	1.5	–	116892.0	1.5	
1380.151	250	72455.81	0.001	187795.8	4.5	–	115339.9	4.5	IV
1379.953	400	72466.24	−0.003	44425.9	2.5	–	116892.0	1.5	
1379.735	250	72477.69	−0.006	35076.9	3.5	–	107554.3	2.5	
1379.221	340	72504.67	−0.001	49439.0	0.5	–	121943.6	1.5	
1378.891	200	72522.04	0.000	187862.0	3.5	–	115339.9	4.5	
1378.663	600	72534.05	−0.004	40345.9	1.5	–	112879.7	2.5	
1378.290	300	72553.69	0.006	185433.7	3.5	–	112879.7	2.5	
1378.165	700	72560.25	0.004	49969.7	1.5	–	122530.1	2.5	
1378.052	700	72566.20	0.007	29754.0	4.5	–	102320.5	3.5	
1377.713	800	72584.05	−0.003	45740.6	3.5	–	118324.5	3.5	
1376.529	30	72646.49	0.000	180200.8	2.5	–	107554.3	2.5	
1375.970	400	72675.98	−0.001	168770.6	2.5	–	96094.7	2.5	
1375.540	130	72698.70	0.000	168793.4	3.5	–	96094.7	2.5	
1375.027	300	72725.85	0.008	97677.5	1.5	–	170403.8	1.5	
1374.482	200	72754.70	0.000	174483.2	3.5	–	101728.5	2.5	
1372.897	80	72838.68	0.003	192866.0	1.5	–	120027.2	2.5	IV
1372.556	80	72856.75	−0.001	180411.0	1.5	–	107554.3	2.5	
1372.457	25	72862.04	0.004	91405.6	2.5	–	164267.8	3.5	
1371.861	5	72893.70	0.000	192920.9	2.5	–	120027.2	2.5	
1370.839	5	72948.01	−0.001	180502.2	2.5	–	107554.3	2.5	
1370.466	30	72967.87	0.000	49439.0	0.5	–	122406.8	0.5	
1369.289	240	73030.61	−0.001	168770.6	2.5	–	95740.1	1.5	
1368.421	400	73076.93	0.000	161865.5	4.5	–	88788.6	3.5	
1367.158	900	73144.43	0.001	35076.9	3.5	–	108221.4	2.5	
1366.877	600	73159.48	−0.005	57818.5	4.5	–	130977.7	3.5	
1366.522	300	73178.46	−0.001	169273.1	1.5	–	96094.7	2.5	
1365.947	600	73209.27	0.000	49969.7	1.5	–	123179.0	1.5	
1365.382	990	73239.60	0.001	29754.0	4.5	–	102993.6	5.5	
1365.132	100	73252.97	0.002	181474.5	2.5	–	108221.4	2.5	
1363.934	180	73317.33	−0.003	186196.9	2.5	–	112879.7	2.5	
1363.629	500	73333.75	0.007	54133.2	1.5	–	127467.4	1.5	
1363.548	100	73338.11	0.004	99843.7	4.5	–	173182.0	4.5	
1362.045	600	73419.04	0.000	40345.9	1.5	–	113764.9	0.5	
1361.806	15	73431.89	−0.001	186311.6	3.5	–	112879.7	2.5	
1359.934	200	73532.99	0.001	169273.1	1.5	–	95740.1	1.5	
1358.266	30	73623.26	0.000	90509.7	3.5	–	164133.0	4.5	
1356.703	500	73708.08	−0.001	52059.6	2.5	–	125767.6	2.5	
1356.117	700	73739.97	0.000	49439.0	0.5	–	123179.0	1.5	
1355.606	800	73767.73	0.008	58584.5	3.5	–	132352.7	4.5	II
1355.281	250	73785.46	0.004	179594.8	4.5	–	105809.1	3.5	
1354.332	30	73837.12	−0.001	180100.4	0.5	–	106263.4	1.5	
1353.206	600	73898.60	−0.002	44425.9	2.5	–	118324.5	3.5	
1352.496	200	73937.35	0.000	180200.8	2.5	–	106263.4	1.5	
1351.172	150	74009.83	−0.025	64243.9	2.5	–	138252.3	1.5	w
1350.307	600	74057.24	0.001	38822.4	2.5	–	112879.7	2.5	
1350.078	150	74069.81	0.003	179879.1	3.5	–	105809.1	3.5	
1349.212	350	74117.33	0.001	54133.2	1.5	–	128250.6	1.5	
1348.879	600	74135.62	−0.004	44425.9	2.5	–	118561.3	1.5	
1348.663	40	74147.52	0.001	180411.0	1.5	–	106263.4	1.5	
1348.318	1	74166.51	0.010	97677.5	1.5	–	171844.6	2.5	

Table I. *Continued*

1347.002	2	74238.93	−0.002	180502.2	2.5	–	106263.4	1.5	
1346.687	200	74256.28	−0.004	79313.5	4.5	–	153569.6	4.5	
1346.136	400	74286.68	−0.001	45740.6	3.5	–	120027.2	2.5	
1345.745	5	74308.27	−0.004	187187.8	2.5	–	112879.7	2.5	
1344.894	80	74355.33	−0.002	91405.6	2.5	–	165760.8	2.5	
1344.704	700	74365.80	0.003	58584.5	3.5	–	132950.5	3.5	
1344.454	100	74379.63	−0.004	54133.2	1.5	–	128512.7	2.5	w
1341.669	800	74534.03	0.003	57818.5	4.5	–	132352.7	4.5	
1340.929	50	74575.14	−0.004	90509.7	3.5	–	165084.6	4.5	
1339.135	200	74675.04	−0.001	170769.7	2.5	–	96094.7	2.5	
1338.894	300	74688.51	0.002	79313.5	4.5	–	154002.1	3.5	
1338.818	1	74692.77	0.006	180502.2	2.5	–	105809.1	3.5	
1338.120	40	74731.74	−0.004	58326.9	0.5	–	133058.5	1.5	IV
1336.707	950	74810.69	−0.001	29754.0	4.5	–	104564.6	4.5	
1334.774	20	74919.06	−0.004	97677.5	1.5	–	172596.4	1.5	
1333.401	80	74996.17	−0.001	176724.6	2.5	–	101728.5	2.5	
1332.813	160	75029.27	0.006	170769.7	2.5	–	95740.1	1.5	
	Bl	75029.27	−0.015	40345.9	1.5	–	115374.3	2.5	
1332.149	200	75066.67	−0.004	193390.9	3.5	–	118324.5	3.5	
1330.983	70	75132.47	−0.009	57818.5	4.5	–	132950.5	3.5	
1329.586	120	75211.39	−0.006	181474.5	2.5	–	106263.4	1.5	
1328.885	10	75251.04	0.000	90509.7	3.5	–	165760.8	2.5	
1326.118	400	75408.08	−0.006	52059.6	2.5	–	127467.4	1.5	IV
1325.989	40	75415.39	−0.003	197945.3	2.5	–	122530.1	2.5	
1325.770	100	75427.85	−0.001	166837.3	3.5	–	91409.5	4.5	
1325.420	90	75447.77	−0.005	183631.1	1.5	–	108183.6	0.5	
1324.181	150	75518.41	−0.002	181781.7	1.5	–	106263.4	1.5	
1322.739	400	75600.73	0.010	44425.9	2.5	–	120027.2	2.5	w
1321.850	140	75651.55	−0.003	198181.5	3.5	–	122530.1	2.5	
1321.599	120	75665.91	−0.010	181474.5	2.5	–	105809.1	3.5	IV
1320.001	50	75757.50	0.009	90509.7	3.5	–	166267.7	3.5	
1319.311	700	75797.15	0.014	49969.7	1.5	–	125767.6	2.5	IV
1317.934	250	75876.36	−0.001	49969.7	1.5	–	125846.0	0.5	
1317.386	100	75907.89	−0.004	35076.9	3.5	–	110984.6	3.5	
1317.201	250	75918.58	0.000	167328.1	5.5	–	91409.5	4.5	
1316.942	60	75933.50	−0.002	185321.0	1.5	–	109387.6	1.5	
1316.660	50	75949.77	0.004	194274.5	4.5	–	118324.5	3.5	
1315.540	100	76014.44	0.002	99843.7	4.5	–	175858.2	5.5	
1314.833	600	76055.28	−0.003	29754.0	4.5	–	105809.1	3.5	
1314.308	70	76085.68	0.001	45740.6	3.5	–	121826.3	3.5	
1313.309	20	76143.53	0.001	185531.1	1.5	–	109387.6	1.5	
1312.506	200	76190.11	0.016	52059.6	2.5	–	128250.6	1.5	IV
1310.515	100	76305.91	−0.001	58584.5	3.5	–	134890.4	3.5	
1309.444	400	76368.28	0.002	58584.5	3.5	–	134952.9	2.5	
1308.784	130	76406.81	0.003	49439.0	0.5	–	125846.0	0.5	
1308.291	400	76435.58	−0.004	167844.9	4.5	–	91409.5	4.5	
1307.987	300	76453.35	−0.005	52059.6	2.5	–	128512.7	2.5	
1306.402	300	76546.14	0.000	40345.9	1.5	–	116892.0	1.5	
	Bl	76546.14	−0.017	91405.6	2.5	–	167950.7	3.5	
1306.306	300	76551.72	0.003	38822.4	2.5	–	115374.3	2.5	
1304.922	300	76632.94	−0.002	191972.7	5.5	–	115339.9	4.5	
1302.254	300	76789.92	−0.006	45740.6	3.5	–	122530.1	2.5	
1301.917	150	76809.83	−0.009	186196.9	2.5	–	109387.6	1.5	
1297.487	200	77072.06	−0.004	57818.5	4.5	–	134890.4	3.5	w
	Bl	77098.47	−0.022	193390.9	3.5	–	116293.7	3.5	
1297.043	100	77098.47	0.019	185321.0	1.5	–	108221.4	2.5	
1296.064	80	77156.67	−0.004	58584.5	3.5	–	135741.0	4.5	
1295.128	140	77212.45	−0.002	185433.7	3.5	–	108221.4	2.5	
1295.010	100	77219.50	0.001	79313.5	4.5	–	156533.1	3.5	IV
1294.091	200	77274.31	−0.001	179594.8	4.5	–	102320.5	3.5	
1293.870	100	77287.49	−0.002	179015.9	1.5	–	101728.5	2.5	
1293.711	30	77296.99	0.012	97677.5	1.5	–	174975.2	2.5	
1292.527	1	77367.81	−0.002	183631.1	1.5	–	106263.4	1.5	
1292.260	40	77383.82	0.001	168793.4	3.5	–	91409.5	4.5	
1291.983	500	77400.40	−0.001	44425.9	2.5	–	121826.3	3.5	
1291.312	70	77440.59	0.007	90509.7	3.5	–	167950.7	3.5	
1290.798	400	77471.46	−0.002	38822.4	2.5	–	116293.7	3.5	
1290.373	400	77496.97	0.012	49969.7	1.5	–	127467.4	1.5	
1290.016	300	77518.42	−0.013	44425.9	2.5	–	121943.6	1.5	
1289.348	100	77558.59	−0.001	179879.1	3.5	–	102320.5	3.5	
1287.772	200	77653.48	−0.002	166442.0	2.5	–	88788.6	3.5	
1287.459	80	77672.38	−0.005	173766.8	2.5	–	96094.7	2.5	
1287.074	100	77695.63	−0.003	173435.5	1.5	–	95740.1	1.5	

Table I. *Continued*

1286.614	2	77723.41	0.002	63670.6	1.5	–	141394.2	2.5	
1285.891	130	77767.09	−0.007	185321.0	1.5	–	107554.3	2.5	
1285.297	200	77803.03	−0.003	35076.9	3.5	–	112879.7	2.5	
1284.037	70	77879.38	0.001	185433.7	3.5	–	107554.3	2.5	
1283.397	10	77918.22	−0.002	197945.3	2.5	–	120027.2	2.5	
1282.451	1	77975.72	−0.004	186196.9	2.5	–	108221.4	2.5	
1282.371	5	77980.56	0.003	194274.5	4.5	–	116293.7	3.5	
1282.107	150	77996.59	0.000	174091.3	3.5	–	96094.7	2.5	
1281.764	2	78017.46	0.000	169427.0	4.5	–	91409.5	4.5	
	Bl	78017.46	−0.014	193390.9	3.5	–	115374.3	2.5	
1281.598	100	78027.62	−0.015	173766.8	2.5	–	95740.1	1.5	w
	Bl	78027.62	0.012	49439.0	0.5	–	127467.4	1.5	
1281.258	170	78048.32	0.006	166837.3	3.5	–	88788.6	3.5	
1280.907	300	78069.70	−0.001	38822.4	2.5	–	116892.0	1.5	
1280.345	40	78103.97	0.004	44425.9	2.5	–	122530.1	2.5	
1280.225	60	78111.30	0.002	79313.5	4.5	–	157424.9	4.5	
1279.578	50	78150.80	−0.004	179879.1	3.5	–	101728.5	2.5	
1279.524	30	78154.09	0.003	198181.5	3.5	–	120027.2	2.5	
1278.521	400	78215.38	0.001	40345.9	1.5	–	118561.3	1.5	
1277.451	60	78280.87	0.001	49969.7	1.5	–	128250.6	1.5	
1276.566	20	78335.18	0.010	186557.2	2.5	–	108221.4	2.5	
1276.253	40	78354.37	0.000	91405.6	2.5	–	169759.9	2.5	
1276.184	5	78358.59	0.000	186542.2	0.5	–	108183.6	0.5	
1275.681	30	78389.48	−0.016	174483.2	3.5	–	96094.7	2.5	w
1274.335	30	78472.31	−0.001	180200.8	2.5	–	101728.5	2.5	
1273.196	30	78542.51	0.008	49969.7	1.5	–	128512.7	2.5	
1273.095	2	78548.72	0.002	64243.9	2.5	–	142792.7	1.5	
1271.574	15	78642.68	−0.001	186196.9	2.5	–	107554.3	2.5	p
1269.809	20	78752.01	0.016	44425.9	2.5	–	123179.0	1.5	w
1269.721	5	78757.47	−0.003	186311.6	3.5	–	107554.3	2.5	
1269.460	10	78773.68	0.000	180502.2	2.5	–	101728.5	2.5	
1269.217	2	78788.73	−0.002	90971.3	1.5	–	169759.9	2.5	
1268.844	50	78811.92	−0.005	49439.0	0.5	–	128250.6	1.5	p
1267.138	10	78918.03	0.001	52059.6	2.5	–	130977.7	3.5	
1267.024	130	78925.12	0.002	54133.2	1.5	–	133058.5	1.5	
1266.881	60	78934.00	0.008	194274.5	4.5	–	115339.9	4.5	
1265.861	10	78997.60	−0.008	175091.8	3.5	–	96094.7	2.5	
	Bl	78997.60	0.010	91405.6	2.5	–	170403.8	1.5	
1265.780	20	79002.66	0.004	186557.2	2.5	–	107554.3	2.5	
1264.925	200	79056.08	0.003	167844.9	4.5	–	88788.6	3.5	
1263.360	20	79154.00	−0.001	181474.5	2.5	–	102320.5	3.5	
1259.798	80	79377.79	0.000	58326.9	0.5	–	137704.7	0.5	
1259.705	2	79383.69	0.005	197945.3	2.5	–	118561.3	1.5	
1258.930	130	79432.56	−0.002	90971.3	1.5	–	170403.8	1.5	
1255.752	30	79633.55	−0.001	187187.8	2.5	–	107554.3	2.5	
1254.997	200	79681.44	−0.002	40345.9	1.5	–	120027.2	2.5	
1254.697	20	79700.55	0.005	97677.5	1.5	–	177378.4	2.5	
1254.094	80	79738.81	0.002	38822.4	2.5	–	118561.3	1.5	
1253.982	30	79745.95	0.000	181474.5	2.5	–	101728.5	2.5	
1253.720	130	79762.61	0.000	79313.5	4.5	–	159076.2	3.5	
1253.662	10	79766.29	−0.002	189153.7	2.5	–	109387.6	1.5	
1252.448	30	79843.61	0.002	45740.6	3.5	–	125584.3	4.5	
1251.164	20	79925.56	−0.003	58326.9	0.5	–	138252.3	1.5	
1251.044	8	79933.23	0.004	186196.9	2.5	–	106263.4	1.5	
1250.710	2	79954.61	0.002	189342.3	1.5	–	109387.6	1.5	
1249.842	1	80010.13	0.007	175750.6	1.5	–	95740.1	1.5	
1249.584	70	80026.66	0.006	45740.6	3.5	–	125767.6	2.5	
1245.884	300	80264.27	−0.019	35076.9	3.5	–	115339.9	4.5	
1245.662	2	80278.59	0.004	186542.2	0.5	–	106263.4	1.5	
1245.418	80	80294.32	−0.009	186557.2	2.5	–	106263.4	1.5	p
1245.369	60	80297.49	−0.001	35076.9	3.5	–	115374.3	2.5	p
1243.186	20	80438.51	0.008	91405.6	2.5	–	171844.6	2.5	
1239.975	600	80646.77	0.004	35076.9	3.5	–	115724.0	4.5	
1237.984	3	80776.51	0.001	186585.7	4.5	–	105809.1	3.5	IV
1237.332	40	80819.07	0.010	54133.2	1.5	–	134952.9	2.5	
1235.276	15	80953.56	−0.019	193832.0	2.5	–	112879.7	2.5	IV
1235.003	5	80971.45	0.013	185321.0	1.5	–	104348.6	0.5	
1234.588	40	80998.66	0.003	52059.6	2.5	–	133058.5	1.5	
1232.156	30	81158.55	0.002	189342.3	1.5	–	108183.6	0.5	
1231.791	40	81182.59	−0.001	185531.1	1.5	–	104348.6	0.5	
1231.664	40	81190.97	−0.003	91405.6	2.5	–	172596.4	1.5	
1231.452	70	81204.95	−0.002	38822.4	2.5	–	120027.2	2.5	
1231.273	300	81216.73	0.002	35076.9	3.5	–	116293.7	3.5	

Table I. *Continued*

1231.065	200	81230.47	0.002	29754.0	4.5	–	110984.6	3.5	
1230.862	25	81243.85	0.002	58584.5	3.5	–	139828.5	3.5	
1229.487	10	81334.75	0.002	90509.7	3.5	–	171844.6	2.5	
1229.381	200	81341.77	−0.002	44425.9	2.5	–	125767.6	2.5	
1228.842	80	81377.44	0.018	187187.8	2.5	–	105809.1	3.5	
1226.156	80	81555.68	0.002	90971.3	1.5	–	172527.2	2.5	
1225.521	100	81597.98	−0.004	40345.9	1.5	–	121943.6	1.5	IV
1225.113	30	81625.09	−0.001	90971.3	1.5	–	172596.4	1.5	
1223.279	20	81747.53	−0.009	186311.6	3.5	–	104564.6	4.5	
1223.085	30	81760.46	−0.003	91405.6	2.5	–	173165.8	2.5	p
1222.205	80	81819.36	0.005	91405.6	2.5	–	173225.3	3.5	IV
1219.711	2	81986.66	0.001	187795.8	4.5	–	105809.1	3.5	
1218.600	100	82061.37	−0.006	40345.9	1.5	–	122406.8	0.5	
1216.778	2	82184.29	−0.001	40345.9	1.5	–	122530.1	2.5	
1214.837	20	82315.60	−0.003	91405.6	2.5	–	173721.0	1.5	
1209.832	40	82656.10	0.000	90509.7	3.5	–	173165.8	2.5	
1209.591	200	82672.57	−0.004	90509.7	3.5	–	173182.0	4.5	
1208.463	30	82749.77	−0.002	90971.3	1.5	–	173721.0	1.5	
1207.646	15	82805.73	0.021	198181.5	3.5	–	115374.3	2.5	
1207.269	90	82831.56	−0.012	52059.6	2.5	–	134890.4	3.5	
1207.020	5	82848.64	−0.017	193832.0	2.5	–	110984.6	3.5	
1206.302	100	82897.97	0.001	79313.5	4.5	–	162211.6	4.5	
1205.180	15	82975.16	−0.004	91405.6	2.5	–	174380.5	3.5	
1204.760	50	83004.06	−0.002	38822.4	2.5	–	121826.3	3.5	
1204.218	30	83041.48	−0.001	44425.9	2.5	–	127467.4	1.5	
1204.150	400	83046.10	0.000	12694.0	1.5	–	95740.1	1.5	
1203.530	30	83088.94	−0.002	49969.7	1.5	–	133058.5	1.5	
1201.237	5	83247.54	0.000	35076.9	3.5	–	118324.5	3.5	
1200.617	60	83290.48	−0.008	194274.5	4.5	–	110984.6	3.5	IV
1199.708	10	83353.62	−0.012	64243.9	2.5	–	147596.7	3.5	
1199.026	300	83401.06	−0.005	12694.0	1.5	–	96094.7	2.5	
1196.619	10	83568.81	0.013	91405.6	2.5	–	174975.2	2.5	
1195.893	5	83619.55	−0.001	49439.0	0.5	–	133058.5	1.5	
1194.982	10	83683.30	−0.014	175091.8	3.5	–	91409.5	4.5	
1194.664	30	83705.53	−0.005	185433.7	3.5	–	101728.5	2.5	
1193.553	40	83783.48	0.013	179879.1	3.5	–	96094.7	2.5	
1192.967	10	83824.62	0.001	44425.9	2.5	–	128250.6	1.5	
1192.314	30	83870.51	0.003	90509.7	3.5	–	174380.5	3.5	
1189.251	30	84086.57	0.002	44425.9	2.5	–	128512.7	2.5	
1185.436	50	84357.17	−0.009	38822.4	2.5	–	123179.0	1.5	
1184.858	30	84398.32	−0.008	79313.5	4.5	–	163711.3	3.5	
1184.208	1	84444.62	−0.002	193832.0	2.5	–	109387.6	1.5	
1183.910	100	84465.88	−0.001	58326.9	0.5	–	142792.7	1.5	w
	Bl	84465.88	−0.005	90509.7	3.5	–	174975.2	2.5	
1178.974	100	84819.55	−0.001	79313.5	4.5	–	164133.0	4.5	
1177.157	60	84950.43	−0.002	35076.9	3.5	–	120027.2	2.5	p
1176.708	3	84982.82	0.006	49969.7	1.5	–	134952.9	2.5	
1176.411	600	85004.30	0.001	79313.5	4.5	–	164317.9	5.5	
1174.949	30	85110.10	−0.003	58584.5	3.5	–	143694.4	3.5	
1173.199	30	85237.02	0.001	45740.6	3.5	–	130977.7	3.5	
1172.177	8	85311.32	0.006	192866.0	1.5	–	107554.3	2.5	
1170.678	30	85420.58	0.016	40345.9	1.5	–	125767.6	2.5	IV
1165.893	60	85771.19	−0.001	79313.5	4.5	–	165084.6	4.5	
1163.453	20	85951.07	−0.007	58584.5	3.5	–	144535.1	4.5	
1160.191	20	86192.74	0.000	52059.6	2.5	–	138252.3	1.5	
1157.332	1	86405.66	0.019	90971.3	1.5	–	177378.4	2.5	
1155.379	1	86551.69	0.001	44425.9	2.5	–	130977.7	3.5	
1153.179	5	86716.79	−0.002	57818.5	4.5	–	144535.1	4.5	
1152.746	100	86749.36	0.001	35076.9	3.5	–	121826.3	3.5	
1151.166	30	86868.46	0.003	90509.7	3.5	–	177378.4	2.5	
1150.029	40	86954.31	−0.002	79313.5	4.5	–	166267.7	3.5	
1149.276	1	87011.27	−0.001	64243.9	2.5	–	151255.1	3.5	
1146.656	8	87210.11	−0.003	45740.6	3.5	–	132950.5	3.5	
1145.987	3	87260.99	0.000	54133.2	1.5	–	141394.2	2.5	
1143.469	30	87453.16	0.001	35076.9	3.5	–	122530.1	2.5	
1142.385	10	87536.17	0.003	183631.1	1.5	–	96094.7	2.5	
1137.596	1	87904.63	0.001	40345.9	1.5	–	128250.6	1.5	
1136.573	3	87983.79	−0.007	58584.5	3.5	–	146567.8	4.5	
1132.243	40	88320.25	0.002	79313.5	4.5	–	167633.9	4.5	
1130.894	80	88425.66	0.000	79313.5	4.5	–	167739.2	5.5	
1129.043	40	88570.59	−0.001	29754.0	4.5	–	118324.5	3.5	
1128.195	5	88637.17	0.000	79313.5	4.5	–	167950.7	3.5	
1128.097	10	88644.83	0.002	38822.4	2.5	–	127467.4	1.5	

Table I. *Continued*

1126.763	20	88749.78	−0.007	57818.5	4.5	–	146567.8	4.5	
1126.267	10	88788.88	−0.004	0.0	2.5	–	88788.6	3.5	
1123.159	100	89034.60	−0.001	12694.0	1.5	–	101728.5	2.5	
1121.708	3	89149.72	0.001	45740.6	3.5	–	134890.4	3.5	
1121.461	10	89169.38	−0.006	54133.2	1.5	–	143302.2	1.5	IV
1120.922	10	89212.27	0.001	45740.6	3.5	–	134952.9	2.5	
1119.385	5	89334.76	−0.004	63670.6	1.5	–	153005.1	1.5	w
	Bl	89334.76	−0.002	52059.6	2.5	–	141394.2	2.5	
1118.214	2	89428.32	−0.001	38822.4	2.5	–	128250.6	1.5	
1116.159	10	89592.97	0.000	90509.7	3.5	–	181102.7	4.5	
1114.846	2	89698.50	−0.002	54133.2	1.5	–	143831.6	2.5	
1105.408	15	90464.32	0.001	44425.9	2.5	–	134890.4	3.5	
1102.649	3	90690.67	0.001	35076.9	3.5	–	125767.6	2.5	
1095.982	2	91242.38	0.002	52059.6	2.5	–	143302.2	1.5	
1093.798	2	91424.56	−0.001	49969.7	1.5	–	141394.2	2.5	
1091.053	1	91654.59	0.001	12694.0	1.5	–	104348.6	0.5	
1089.660	2	91771.74	0.003	52059.6	2.5	–	143831.6	2.5	
1086.109	100	92071.80	0.006	29754.0	4.5	–	121826.3	3.5	
1078.605	1	92712.32	0.003	40345.9	1.5	–	133058.5	1.5	
1077.320	20	92822.92	0.001	49969.7	1.5	–	142792.7	1.5	
	Bl	92822.92	−0.014	63670.6	1.5	–	156492.4	0.5	
1071.197	15	93353.53	0.002	49439.0	0.5	–	142792.7	1.5	
1068.725	20	93569.48	−0.001	12694.0	1.5	–	106263.4	1.5	
1065.801	30	93826.19	0.002	44425.9	2.5	–	138252.3	1.5	
1065.394	30	93862.00	−0.001	49969.7	1.5	–	143831.6	2.5	
1056.210	1	94678.12	0.001	58326.9	0.5	–	153005.1	1.5	
1054.184	130	94860.07	0.003	12694.0	1.5	–	107554.3	2.5	
1052.791	10	94985.59	−0.006	58584.5	3.5	–	153569.6	4.5	
1048.024	10	95417.70	−0.001	58584.5	3.5	–	154002.1	3.5	
1046.818	300	95527.60	−0.002	12694.0	1.5	–	108221.4	2.5	
1046.716	10	95536.93	0.002	52059.6	2.5	–	147596.7	3.5	
1044.494	300	95740.17	−0.001	0.0	2.5	–	95740.1	1.5	
1043.513	80	95830.17	0.002	29754.0	4.5	–	125584.3	4.5	
1042.745	30	95900.68	0.002	35076.9	3.5	–	130977.7	3.5	
1040.639	800	96094.78	−0.001	0.0	2.5	–	96094.7	2.5	
1035.788	1	96544.81	−0.001	79313.5	4.5	–	175858.2	5.5	
1034.196	300	96693.44	0.001	12694.0	1.5	–	109387.6	1.5	
1027.286	20	97343.89	0.003	52059.6	2.5	–	149403.8	1.5	
1027.130	10	97358.68	0.002	40345.9	1.5	–	137704.7	0.5	
1021.726	35	97873.59	0.000	35076.9	3.5	–	132950.5	3.5	
1019.462	50	98090.92	0.001	45740.6	3.5	–	143831.6	2.5	
1018.694	10	98164.94	0.005	58326.9	0.5	–	156492.4	0.5	
1016.601	35	98366.98	−0.002	44425.9	2.5	–	142792.7	1.5	
1014.975	80	98524.60	−0.002	58326.9	0.5	–	156851.3	1.5	
1011.363	40	98876.45	−0.003	44425.9	2.5	–	143302.2	1.5	
1008.109	80	99195.64	−0.002	52059.6	2.5	–	151255.1	3.5	
1007.037	15	99301.26	−0.011	49969.7	1.5	–	149269.9	2.5	
1005.352	15	99467.61	−0.002	64243.9	2.5	–	163711.3	3.5	
1003.618	15	99639.47	0.000	29754.0	4.5	–	129393.4	5.5	
1001.612	1	99839.08	0.001	63670.6	1.5	–	163509.8	2.5	
1000.348	3	99965.26	−0.004	49439.0	0.5	–	149403.8	1.5	
999.765	30	100023.47	0.005	64243.9	2.5	–	164267.8	3.5	
998.153	100	100185.05	0.007	12694.0	1.5	–	112879.7	2.5	
993.402	120	100664.22	−0.002	35076.9	3.5	–	135741.0	4.5	
991.792	40	100827.63	−0.004	45740.6	3.5	–	146567.8	4.5	
990.753	10	100933.34	−0.001	64243.9	2.5	–	165177.1	1.5	
990.601	30	100948.85	0.004	54133.2	1.5	–	155082.5	2.5	
990.037	110	101006.31	−0.002	38822.4	2.5	–	139828.5	3.5	
989.624	40	101048.52	−0.002	40345.9	1.5	–	141394.2	2.5	
989.402	150	101071.16	−0.002	12694.0	1.5	–	113764.9	0.5	
985.156	20	101506.74	−0.003	63670.6	1.5	–	165177.1	1.5	
983.018	200	101727.55	0.009	0.0	2.5	–	101728.5	2.5	
980.942	50	101942.84	−0.003	52059.6	2.5	–	154002.1	3.5	
977.317	300	102320.90	−0.004	0.0	2.5	–	102320.5	3.5	
976.951	1	102359.31	−0.002	54133.2	1.5	–	156492.4	0.5	
976.110	100	102447.46	−0.006	40345.9	1.5	–	142792.7	1.5	
974.922	150	102572.36	−0.005	38822.4	2.5	–	141394.2	2.5	
974.669	5	102598.98	−0.002	29754.0	4.5	–	132352.7	4.5	
973.897	400	102680.29	0.000	12694.0	1.5	–	115374.3	2.5	
973.535	10	102718.40	−0.003	54133.2	1.5	–	156851.3	1.5	
972.669	10	102809.89	−0.003	54133.2	1.5	–	156942.8	2.5	
971.285	50	102956.44	−0.001	40345.9	1.5	–	143302.2	1.5	
970.656	40	103023.08	−0.002	52059.6	2.5	–	155082.5	2.5	

Table I. *Continued*

970.540	25	103035.43	0.000	49969.7	1.5	–	153005.1	1.5
969.024	20	103196.58	0.000	29754.0	4.5	–	132950.5	3.5
965.908	30	103529.54	−0.002	45740.6	3.5	–	149269.9	2.5
961.812	50	103970.42	−0.001	38822.4	2.5	–	142792.7	1.5
959.768	110	104191.85	−0.002	54133.2	1.5	–	158324.8	2.5
959.715	170	104197.61	0.004	12694.0	1.5	–	116892.0	1.5
957.125	50	104479.53	0.002	38822.4	2.5	–	143302.2	1.5
954.641	130	104751.42	0.002	35076.9	3.5	–	139828.5	3.5
954.275	3	104791.60	0.001	52059.6	2.5	–	156851.3	1.5
953.801	130	104843.73	0.002	44425.9	2.5	–	149269.9	2.5
	Bl	104843.73	−0.008	49969.7	1.5	–	154812.5	0.5
953.546	140	104871.71	0.003	38822.4	2.5	–	143694.4	3.5
952.582	50	104977.83	0.000	44425.9	2.5	–	149403.8	1.5
952.300	170	105008.97	0.002	38822.4	2.5	–	143831.6	2.5
951.358	50	105112.95	−0.002	49969.7	1.5	–	155082.5	2.5
951.148	30	105136.15	0.002	29754.0	4.5	–	134890.4	3.5
949.004	5	105373.59	−0.001	49439.0	0.5	–	154812.5	0.5
947.738	35	105514.34	0.001	45740.6	3.5	–	151255.1	3.5
947.433	4	105548.33	0.001	58584.5	3.5	–	164133.0	4.5
946.518	150	105650.42	−0.001	49439.0	0.5	–	155089.3	1.5
945.100	900	105808.95	0.001	0.0	2.5	–	105809.1	3.5
944.658	120	105858.43	0.003	52059.6	2.5	–	157918.3	3.5
944.582	500	105866.92	0.004	12694.0	1.5	–	118561.3	1.5
944.354	20	105892.55	0.002	57818.5	4.5	–	163711.3	3.5
943.523	5	105985.75	0.011	29754.0	4.5	–	135741.0	4.5
941.058	200	106263.35	0.000	0.0	2.5	–	106263.4	1.5
940.584	40	106316.96	0.003	35076.9	3.5	–	141394.2	2.5
938.768	5	106522.65	0.000	49969.7	1.5	–	156492.4	0.5
936.072	150	106829.43	−0.003	44425.9	2.5	–	151255.1	3.5
935.894	2	106849.74	0.004	58326.9	0.5	–	165177.1	1.5
934.816	60	106972.94	0.002	49969.7	1.5	–	156942.8	2.5
934.435	1	107016.55	0.000	52059.6	2.5	–	159076.2	3.5
934.115	50	107053.21	0.001	49439.0	0.5	–	156492.4	0.5
933.050	12	107175.44	0.007	58584.5	3.5	–	165760.8	2.5
931.678	90	107333.20	0.000	12694.0	1.5	–	120027.2	2.5
929.764	100	107554.13	0.001	0.0	2.5	–	107554.3	2.5
929.362	30	107600.64	0.001	64243.9	2.5	–	171844.6	2.5
927.389	15	107829.58	−0.005	45740.6	3.5	–	153569.6	4.5
924.427	4	108175.08	−0.010	63670.6	1.5	–	171844.6	2.5
924.028	900	108221.87	−0.004	0.0	2.5	–	108221.4	2.5
920.661	300	108617.57	0.000	35076.9	3.5	–	143694.4	3.5
919.501	20	108754.68	0.000	35076.9	3.5	–	143831.6	2.5
919.334	80	108774.34	−0.001	38822.4	2.5	–	147596.7	3.5
918.645	15	108855.95	0.005	63670.6	1.5	–	172527.2	2.5
918.071	60	108924.06	0.000	40345.9	1.5	–	149269.9	2.5
916.944	30	109057.95	0.000	40345.9	1.5	–	149403.8	1.5
915.337	50	109249.33	0.003	12694.0	1.5	–	121943.6	1.5
914.562	30	109341.92	0.000	45740.6	3.5	–	155082.5	2.5
914.181	120	109387.57	0.000	0.0	2.5	–	109387.6	1.5
913.590	150	109458.31	−0.001	35076.9	3.5	–	144535.1	4.5
912.132	10	109633.28	0.002	45740.6	3.5	–	155374.0	3.5
911.470	600	109712.89	0.000	12694.0	1.5	–	122406.8	0.5
910.447	800	109836.20	0.000	12694.0	1.5	–	122530.1	2.5
909.747	100	109920.73	0.000	57818.5	4.5	–	167739.2	5.5
908.474	70	110074.67	−0.001	29754.0	4.5	–	139828.5	3.5
905.472	40	110439.60	−0.005	49969.7	1.5	–	160408.7	2.5
905.408	10	110447.40	0.001	38822.4	2.5	–	149269.9	2.5
905.100	400	110485.03	−0.001	12694.0	1.5	–	123179.0	1.5
904.312	200	110581.34	0.001	38822.4	2.5	–	149403.8	1.5
903.692	100	110657.18	−0.005	44425.9	2.5	–	155082.5	2.5
903.634	200	110664.25	−0.007	44425.9	2.5	–	155089.3	1.5
902.588	120	110792.58	−0.001	45740.6	3.5	–	156533.1	3.5
901.317	4	110948.78	−0.006	44425.9	2.5	–	155374.0	3.5
901.022	800	110985.11	−0.004	0.0	2.5	–	110984.6	3.5
900.542	4	111044.18	−0.003	54133.2	1.5	–	165177.1	1.5
900.246	50	111080.76	0.011	57818.5	4.5	–	168900.7	3.5
897.261	1	111450.28	−0.001	52059.6	2.5	–	163509.8	2.5
895.836	15	111627.60	−0.001	54133.2	1.5	–	165760.8	2.5
895.643	15	111651.62	0.000	52059.6	2.5	–	163711.3	3.5
895.379	20	111684.52	−0.001	45740.6	3.5	–	157424.9	4.5
892.006	30	112106.91	0.002	44425.9	2.5	–	156533.1	3.5
891.201	55	112208.14	0.001	52059.6	2.5	–	164267.8	3.5
	Bl	112208.14	0.001	40345.9	1.5	–	152554.1	2.5

Table I. *Continued*

889.424	80	112432.26	0.003	38822.4	2.5	–	151255.1	3.5
888.733	20	112519.75	0.000	35076.9	3.5	–	147596.7	3.5
888.225	25	112584.12	0.001	45740.6	3.5	–	158324.8	2.5
886.518	35	112800.91	0.000	49969.7	1.5	–	162770.6	1.5
885.900	800	112879.53	0.001	0.0	2.5	–	112879.7	2.5
883.779	500	113150.40	−0.002	29754.0	4.5	–	142904.0	5.5
879.501	50	113700.90	0.002	52059.6	2.5	–	165760.8	2.5
879.262	8	113731.79	−0.001	38822.4	2.5	–	152554.1	2.5
877.971	5	113899.03	−0.001	44425.9	2.5	–	158324.8	2.5
877.652	100	113940.36	0.001	29754.0	4.5	–	143694.4	3.5
875.791	30	114182.46	0.002	38822.4	2.5	–	153005.1	1.5
875.711	70	114192.94	0.000	35076.9	3.5	–	149269.9	2.5
873.618	100	114466.49	0.001	40345.9	1.5	–	154812.5	0.5
872.620	70	114597.44	0.000	58584.5	3.5	–	173182.0	4.5
872.083	50	114668.01	0.001	45740.6	3.5	–	160408.7	2.5
871.563	80	114736.41	0.001	40345.9	1.5	–	155082.5	2.5
871.513	100	114742.99	0.004	40345.9	1.5	–	155089.3	1.5
871.287	12	114772.69	0.005	12694.0	1.5	–	127467.4	1.5
871.226	10	114780.82	0.003	29754.0	4.5	–	144535.1	4.5
868.211	50	115179.35	0.003	38822.4	2.5	–	154002.1	3.5
868.002	40	115207.11	0.002	49969.7	1.5	–	165177.1	1.5
866.826	30	115363.35	0.001	57818.5	4.5	–	173182.0	4.5
866.748	40	115373.84	0.004	0.0	2.5	–	115374.3	2.5
866.600	2	115393.48	0.004	58326.9	0.5	–	173721.0	1.5
865.381	800	115556.05	0.005	12694.0	1.5	–	128250.6	1.5
864.852	40	115626.67	0.000	54133.2	1.5	–	169759.9	2.5
864.021	40	115737.92	0.001	49439.0	0.5	–	165177.1	1.5
863.625	40	115790.96	0.001	49969.7	1.5	–	165760.8	2.5
863.422	800	115818.18	0.004	12694.0	1.5	–	128512.7	2.5
862.876	30	115891.52	−0.003	52059.6	2.5	–	167950.7	3.5
860.090	30	116266.90	0.000	38822.4	2.5	–	155089.3	1.5
859.894	160	116293.39	0.003	0.0	2.5	–	116293.7	3.5
859.599	15	116333.31	0.003	35076.9	3.5	–	151410.5	4.5
858.584	25	116470.90	0.001	45740.6	3.5	–	162211.6	4.5
858.333	50	116504.91	0.004	40345.9	1.5	–	156851.3	1.5
857.993	50	116551.12	0.004	38822.4	2.5	–	155374.0	3.5
857.662	25	116596.09	0.006	40345.9	1.5	–	156942.8	2.5
856.066	400	116813.40	0.003	29754.0	4.5	–	146567.8	4.5
855.866	8	116840.78	0.002	52059.6	2.5	–	168900.7	3.5
855.492	600	116891.85	0.001	0.0	2.5	–	116892.0	1.5
849.544	90	117710.27	0.003	38822.4	2.5	–	156533.1	3.5
849.125	60	117768.27	0.007	45740.6	3.5	–	163509.8	2.5
848.595	180	117841.83	0.006	29754.0	4.5	–	147596.7	3.5
847.615	50	117978.13	0.006	40345.9	1.5	–	158324.8	2.5
847.254	40	118028.35	0.004	38822.4	2.5	–	156851.3	1.5
847.172	50	118039.77	−0.001	57818.5	4.5	–	175858.2	5.5
845.135	800	118324.22	0.002	0.0	2.5	–	118324.5	3.5
844.648	8	118392.45	0.000	45740.6	3.5	–	164133.0	4.5
	Bl	118392.45	0.011	54133.2	1.5	–	172527.2	2.5
843.936	60	118492.43	0.002	35076.9	3.5	–	153569.6	4.5
843.449	700	118560.75	0.004	0.0	2.5	–	118561.3	1.5
840.870	200	118924.51	0.005	35076.9	3.5	–	154002.1	3.5
840.108	130	119032.25	0.002	54133.2	1.5	–	173165.8	2.5
839.658	200	119096.10	−0.001	38822.4	2.5	–	157918.3	3.5
837.916	110	119343.74	0.002	45740.6	3.5	–	165084.6	4.5
836.805	150	119502.16	0.002	38822.4	2.5	–	158324.8	2.5
836.206	5	119587.72	0.000	54133.2	1.5	–	173721.0	1.5
833.146	500	120026.94	0.002	0.0	2.5	–	120027.2	2.5
832.899	200	120062.60	0.002	40345.9	1.5	–	160408.7	2.5
831.273	150	120297.45	−0.002	35076.9	3.5	–	155374.0	3.5
830.331	30	120433.96	0.001	49969.7	1.5	–	170403.8	1.5
830.100	5	120467.48	0.001	52059.6	2.5	–	172527.2	2.5
826.686	50	120964.93	−0.001	49439.0	0.5	–	170403.8	1.5
824.164	5	121335.00	−0.001	44425.9	2.5	–	165760.8	2.5
823.342	100	121456.25	−0.001	35076.9	3.5	–	156533.1	3.5
823.037	150	121501.29	−0.001	29754.0	4.5	–	151255.1	3.5
822.923	70	121518.12	0.000	58584.5	3.5	–	180102.7	4.5
822.453	40	121587.55	−0.008	38822.4	2.5	–	160408.7	2.5
821.984	200	121656.83	−0.002	29754.0	4.5	–	151410.5	4.5
820.848	120	121825.17	0.008	0.0	2.5	–	121826.3	3.5
	Bl	121825.17	−0.010	38822.4	2.5	–	160646.1	3.5
820.737	5	121841.74	0.000	44425.9	2.5	–	166267.7	3.5
820.580	80	121865.04	0.006	35076.9	3.5	–	156942.8	2.5

Table I. *Continued*

820.513	50	121875.01	−0.001	49969.7	1.5	–	171844.6	2.5
820.389	40	121893.45	−0.001	45740.6	3.5	–	167633.9	4.5
820.050	160	121943.81	−0.001	0.0	2.5	–	121943.6	1.5
818.261	50	122210.44	−0.002	45740.6	3.5	–	167950.7	3.5
817.935	100	122259.08	−0.001	12694.0	1.5	–	134952.9	2.5
817.767	40	122284.17	0.000	57818.5	4.5	–	180102.7	4.5
816.827	5	122424.99	−0.002	40345.9	1.5	–	162770.6	1.5
816.127	10	122530.00	0.001	0.0	2.5	–	122530.1	2.5
811.951	5	123160.20	−0.001	45740.6	3.5	–	168900.7	3.5
811.830	100	123178.55	0.003	0.0	2.5	–	123179.0	1.5
811.383	80	123246.44	0.010	35076.9	3.5	–	158324.8	2.5
	Bl	123246.44	−0.008	54133.2	1.5	–	177378.4	2.5
807.652	40	123815.63	0.000	29754.0	4.5	–	153569.6	4.5
806.791	30	123947.87	0.002	38822.4	2.5	–	162770.6	1.5
806.326	4	124019.25	0.001	45740.6	3.5	–	169759.9	2.5
804.840	30	124248.36	−0.001	29754.0	4.5	–	154002.1	3.5
803.376	12	124474.70	0.000	44425.9	2.5	–	168900.7	3.5
802.005	1	124687.42	0.000	38822.4	2.5	–	163509.8	2.5
800.711	50	124888.93	0.000	38822.4	2.5	–	163711.3	3.5
799.930	90	125010.91	−0.001	12694.0	1.5	–	137704.7	0.5
797.878	30	125332.42	−0.004	35076.9	3.5	–	160408.7	2.5
797.353	15	125414.98	0.000	40345.9	1.5	–	165760.8	2.5
797.159	10	125445.44	0.000	38822.4	2.5	–	164267.8	3.5
796.375	50	125569.00	0.002	35076.9	3.5	–	160646.1	3.5
796.051	40	125620.09	0.000	29754.0	4.5	–	155374.0	3.5
795.115	25	125767.95	−0.002	0.0	2.5	–	125767.6	2.5
788.773	70	126779.15	0.000	29754.0	4.5	–	156533.1	3.5
788.320	80	126852.08	0.001	29754.0	4.5	–	156606.1	4.5
786.567	25	127134.81	−0.001	35076.9	3.5	–	162211.6	4.5
784.672	10	127441.75	−0.002	45740.6	3.5	–	173182.0	4.5
784.514	55	127467.49	−0.001	0.0	2.5	–	127467.4	1.5
784.406	1	127484.99	−0.002	45740.6	3.5	–	173225.3	3.5
783.263	85	127670.98	0.000	29754.0	4.5	–	157424.9	4.5
780.629	10	128101.84	−0.004	44425.9	2.5	–	172527.2	2.5
780.244	75	128165.02	−0.004	29754.0	4.5	–	157918.3	3.5
780.209	10	128170.79	−0.002	44425.9	2.5	–	172596.4	1.5
779.718	75	128251.50	−0.005	0.0	2.5	–	128250.6	1.5
778.967	80	128375.13	0.004	29754.0	4.5	–	158129.7	5.5
778.617	30	128432.91	0.000	35076.9	3.5	–	163509.8	2.5
777.393	10	128635.12	−0.004	35076.9	3.5	–	163711.3	3.5
777.319	30	128647.39	−0.002	45740.6	3.5	–	174387.7	4.5
776.757	10	128740.47	−0.004	44425.9	2.5	–	173165.8	2.5
774.853	80	129056.79	−0.004	35076.9	3.5	–	164133.0	4.5
774.046	25	129191.23	−0.002	35076.9	3.5	–	164267.8	3.5
773.787	7	129234.50	0.001	45740.6	3.5	–	174975.2	2.5
773.259	50	129322.82	−0.004	29754.0	4.5	–	159076.2	3.5
769.500	35	129954.49	0.000	44425.9	2.5	–	174380.5	3.5
768.887	2	130058.19	−0.002	40345.9	1.5	–	170403.8	1.5
768.766	12	130078.53	−0.001	38822.4	2.5	–	168900.7	3.5
765.995	4	130549.11	0.001	44425.9	2.5	–	174975.2	2.5
765.200	2	130684.82	−0.005	35076.9	3.5	–	165760.8	2.5
763.986	55	130892.46	−0.002	29754.0	4.5	–	160646.1	3.5
763.720	25	130938.08	−0.003	38822.4	2.5	–	169759.9	2.5
763.488	80	130977.84	−0.001	0.0	2.5	–	130977.7	3.5
762.248	40	131190.84	0.000	35076.9	3.5	–	166267.7	3.5
759.658	10	131638.16	−0.002	45740.6	3.5	–	177378.4	2.5
754.956	7	132458.09	−0.003	29754.0	4.5	–	162211.6	4.5
752.150	3	132952.19	0.001	44425.9	2.5	–	177378.4	2.5
751.753	25	133022.33	−0.001	38822.4	2.5	–	171844.6	2.5
749.761	17	133375.78	−0.004	40345.9	1.5	–	173721.0	1.5
744.160	10	134379.69	−0.004	29754.0	4.5	–	164133.0	4.5
743.416	20	134514.17	−0.002	29754.0	4.5	–	164267.8	3.5
738.926	40	135331.47	−0.004	29754.0	4.5	–	165084.6	4.5
732.528	40	136513.56	0.001	29754.0	4.5	–	166267.7	3.5
731.160	1	136768.91	−0.006	35076.9	3.5	–	171844.6	2.5
727.535	25	137450.52	−0.001	35076.9	3.5	–	172527.2	2.5
725.266	25	137880.48	−0.003	29754.0	4.5	–	167633.9	4.5
724.712	40	137985.80	−0.003	29754.0	4.5	–	167739.2	5.5
724.174	70	138088.30	0.003	35076.9	3.5	–	173165.8	2.5
714.799	2	139899.41	−0.005	35076.9	3.5	–	174975.2	2.5

Table II. *Energy levels of* $5d^9 + 5d^86s + 5d^76s^2$ *in Au III. Theoretical values* E_{th} *and* g_{th} *are derived from a study of* $(5d + 6s)^9$ *in the formalism of orthogonal operators [22]*

J	E_{exp}	E_{th}	ΔE	g_{th}	First comp	%	$5d^9$ %	$5d^86s$ %	$5d^76s^2$ %
5/2	0.00	−10	10	1.200	$5d^9\,^2D$	98	98.3	1.3	0.4
3/2	12693.98	12702	−8	0.800	$5d^9\,^2D$	97	97.1	2.5	0.5
9/2	29753.96	29792	−38	1.325	$5d^86s\,^4F$	96	—	100.0	—
7/2	35076.89	35053	24	1.191	$5d^86s\,^4F$	63	—	99.8	0.2
5/2	38822.40	38802	21	1.330	$5d^86s\,^4P$	42	0.8	99.0	0.3
3/2	40345.88	40364	−18	0.811	$5d^86s\,^2D$	43	1.9	97.2	1.0
5/2	44425.95	44430	−4	1.107	$5d^86s\,^4F$	70	—	99.9	0.1
7/2	45740.58	45718	23	1.170	$5d^86s\,^2F$	60	—	99.6	0.4
1/2	49439.00	49451	−12	2.538	$5d^86s\,^4P$	85	—	99.9	0.1
3/2	49969.68	49973	−3	1.265	$5d^86s\,^4P$	58	—	99.5	0.5
5/2	52059.60	52062	−2	1.165	$5d^86s\,^4F$	48	0.2	99.1	0.7
3/2	54133.24	54146	−13	1.298	$5d^86s\,^2P$	43	0.1	96.9	3.0
9/2	57818.52	57813	6	1.120	$5d^86s\,^2G$	95	—	98.5	1.5
1/2	58326.93	58304	−12	0.832	$5d^86s\,^2P$	86	—	95.9	4.1
7/2	58584.54	58586	−2	0.909	$5d^86s\,^2G$	91	—	99.1	0.9
3/2	63670.65	63665	5	0.894	$5d^86s\,^2D$	50	0.6	97.1	2.3
5/2	64243.88	64237	7	1.083	$5d^86s\,^2D$	42	0.3	98.5	1.2
9/2	79313.52	79323	−8	1.291	$5d^76s^2\,^4F$	82	—	0.7	99.3
1/2		87248		1.961	$5d^86s\,^2S$	82	—	98.2	1.8
7/2	90509.70	90507	2	1.222	$5d^76s^2\,^4F$	95	—	0.1	99.9
3/2	90971.34	90955	16	1.110	$5d^76s^2\,^2P$	33	—	3.6	96.4
5/2	91405.56	91399	7	1.181	$5d^76s^2\,^4F$	49	0.1	0.6	99.4
3/2	97677.53	97657	20	0.986	$5d^76s^2\,^4F$	47	—	1.0	99.0
5/2	98097.56	98120	−22	1.436	$5d^76s^2\,^4P$	71	—	—	100.0
9/2	99843.66	99867	−23	1.083	$5d^76s^2\,^2G$	53	—	0.6	99.4
1/2		102640		2.158	$5d^76s^2\,^4P$	74	—	2.7	97.3
11/2		105791		1.091	$5d^76s^2\,^2H$	100	—	—	100.0
7/2		107779		0.943	$5d^76s^2\,^2G$	79	—	0.9	99.1
3/2		112077		1.139	$5d^76s^2\,^4P$	35	—	0.9	99.1
5/2		112833		1.180	$5d^76s^23\,^2D$	53	0.1	0.6	99.3
5/2		115482		0.913	$5d^76s^2\,^2F$	83	—	1.1	98.9
9/2		118069		0.979	$5d^76s^2\,^2H$	68	—	0.2	99.8
1/2		118502		1.178	$5d^76s^2\,^2P$	71	—	3.3	96.7
7/2		123587		1.105	$5d^76s^2\,^2F$	81	—	0.5	99.5
3/2		124563		0.995	$5d^76s^23\,^2D$	53	0.1	1.2	98.7
3/2		139836		0.837	$5d^76s^21\,^2D$	85	0.3	0.2	99.5
5/2		142097		1.176	$5d^76s^21\,^2D$	67	0.2	0.1	99.7

Table III. *Odd parity levels of Au III. The experimental energies* E_{exp}, *theoretical energies* E_{th} *and deviations* $\Delta E = E_{exp} - E_{th}$ *are in* cm^{-1}. *The theoretical g-factors, the leading components and the total percentages of* $5d^86p$ *and* $5d^76s6p$ *in the eigenfunctions are given in the last columns*

J	E_{exp}	E_{th}	ΔE	g_{th}	Leading comp.	%	$5d^86p$	$5d^76s6p$
7/2	88788.59	88842	−53	1.342	$5d^86p(^3F)^4D$	63	98.5	1.3
9/2	91409.51	91226	184	1.175	$5d^86p(^3F)^2G$	39	98.9	0.9
3/2	95740.07	95859	−119	1.249	$5d^86p(^1D)^2D$	24	96.4	3.3
5/2	96094.70	96064	31	1.126	$5d^86p(^1D)^2F$	26	97.1	2.7
5/2	101728.50	101702	27	1.117	$5d^86p(^3F)^4D$	45	98.2	1.6
7/2	102320.53	102334	−13	1.061	$5d^86p(^3F)^4G$	56	98.7	1.1
11/2	102993.63	102989	4	1.264	$5d^86p(^3F)^4G$	94	99.1	0.7
1/2	104348.64	104446	−98	0.807	$5d^86p(^3P)^4D$	20	96.5	3.1
9/2	104564.62	104569	−4	1.257	$5d^86p(^3F)^4F$	65	97.7	2.1
7/2	105809.09	105929	−120	1.175	$5d^86p(^3F)^2F$	60	97.7	2.1
3/2	106263.40	106430	−167	1.168	$5d^86p(^3P)^4D$	30	96.3	3.4
5/2	107554.27	107370	184	1.127	$5d^86p(^3P)^4P$	31	96.8	2.9
1/2	108183.62	108373	−189	1.736	$5d^86p(^3P)^4P$	58	94.8	4.8
5/2	108221.39	108494	−273	1.167	$5d^86p(^3F)^2D$	52	96.6	3.1
3/2	109387.56	109099	289	1.173	$5d^86p(^1D)^2D$	21	96.0	3.8
7/2	110984.56	111010	−26	1.207	$5d^86p(^1D)^2F$	43	95.7	4.0

Table III. *Continued*

J	E_{exp}	E_{th}	ΔE	g_{th}	Leading comp.	%	$5d^86p$	$5d^76s6p$
5/2	112879.72	113070	−190	1.172	$5d^86p(^3P)^2D$	26	97.6	2.2
1/2	113764.90	113651	113	0.831	$5d^86p(^1D)^2P$	29	94.5	5.2
9/2	115339.93	115429	−89	0.962	$5d^86p(^1G)^2H$	74	96.9	2.3
5/2	115374.32	115170	204	1.076	$5d^86p(^3F)^4D$	27	97.4	2.3
9/2	115723.95	115919	−195	1.153	$5d^86p(^3F)^4G$	56	98.3	1.4
7/2	116293.73	116265	29	1.148	$5d^86p(^3F)^4F$	46	97.2	2.6
3/2	116892.04	116428	464	1.175	$5d^86p(^3P)^2P$	28	96.0	3.8
7/2	118324.47	118257	68	1.123	$5d^86p(^1G)^2F$	41	97.7	2.1
3/2	118561.33	118523	39	1.050	$5d^86p(^1D)^2P$	31	96.3	3.5
5/2	120027.21	120080	−53	1.099	$5d^86p(^3F)^4G$	26	96.7	3.0
7/2	121826.31	121948	−122	1.167	$5d^86p(^3P)^4D$	41	95.3	4.4
3/2	121943.61	121981	−38	1.053	$5d^86p(^3P)^2P$	21	95.2	4.5
1/2	122406.84	122156	251	0.410	$5d^86p(^3F)^4D$	57	96.6	3.1
5/2	122530.15	122690	−159	1.015	$5d^86p(^3F)^2F$	34	95.6	4.1
3/2	123178.95	123178	1	1.366	$5d^86p(^3P)^4S$	26	95.0	4.6
9/2	125584.29	125929	−345	1.451	$5d^76s6p(^4F)^6D$	46	0.4	99.1
5/2	125767.61	125768	0	1.266	$5d^86p(^3P)^4D$	39	93.9	5.8
1/2	125845.97	125888	−42	1.576	$5d^86p(^3P)^2S$	47	93.5	6.1
11/2	127466.78	127561	−94	1.106	$5d^86p(^1G)^2H$	90	95.1	4.6
3/2	127467.36	127442	26	1.363	$5d^86p(^3P)^2D$	40	92.8	6.9
3/2	128250.63	128111	140	0.986	$5d^86p(^3F)^2D$	41	97.7	2.0
5/2	128512.66	128305	207	0.948	$5d^86p(^1G)^2F$	65	96.9	2.8
11/2	129393.39	129147	247	1.360	$5d^76s6p(^4F)^6F$	47	2.1	97.7
7/2	130977.71	130926	52	0.957	$5d^86p(^1G)^2G$	66	92.0	7.7
9/2	132352.72	132355	−3	1.092	$5d^86p(^1G)^2G$	76	94.2	5.5
7/2	132950.50	133157	−206	1.381	$5d^76s6p(^4F)^6F$	30	2.8	96.8
3/2	133058.47	132762	296	1.027	$5d^86p(^1D)^2D$	23	95.1	4.5
7/2	134890.36	134958	−67	1.116	$5d^86p(^1D)^2F$	45	95.4	4.3
5/2	134952.40	135231	−278	1.009	$5d^86p(^1D)^2D$	27	95.1	4.6
9/2	135740.95	135482	259	1.253	$5d^76s6p(^4F)^6G$	28	0.6	99.0
5/2		137589		1.553	$5d^76s6p(^4P)^6S$	27	1.6	98.1
1/2	137704.73	137914	−209	0.638	$5d^86p(^1D)^2P$	44	95.9	3.9
3/2	138252.33	138509	−256	1.433	$5d^76s6p(^4P)^6D$	15	3.0	96.3
7/2	139828.52	139845	−17	1.284	$5d^76s6p(^4F)^6G$	37	0.3	99.4
5/2		140536		1.597	$5d^76s6p(^4P)^6D$	28	0.4	99.3
13/2		140940		1.361	$5d^76s6p(^4F)^6G$	85	—	99.9
1/2		141310		0.945	$5d^76s6p(^4F)^6F$	26	1.6	97.8
5/2	141394.19	141450	−56	1.412	$5d^76s6p(^4P)^6S$	22	1.6	98.1
3/2	142792.72	142633	159	0.983	$5d^76s6p(^4F)^6F$	23	2.4	97.2
11/2	142904.05	142674	230	1.339	$5d^76s6p(^4F)^6F$	41	0.3	99.3
3/2	143302.15	143501	−199	0.816	$5d^76s6p(^4F)^6G$	39	1.6	98.1
7/2	143694.41	143871	−177	1.303	$5d^76s6p(^4F)^4D$	16	1.5	97.7
5/2	143831.56	143528	304	1.116	$5d^76s6p(^4F)^6G$	28	2.3	97.1
9/2	144535.12	144483	52	1.207	$5d^76s6p(^4F)^6F$	26	0.6	98.6
1/2		146067		1.016	$5d^86p(^1S)^2P$	46	65.4	34.2
1/2		146564		1.414	$5d^86p(^1S)^2P$	28	28.2	71.4
9/2	146567.78	146681	−113	1.329	$5d^76s6p(^4F)^6D$	20	0.6	98.7
7/2	147596.67	147276	320	1.293	$5d^76s6p(^4F)^6G$	23	0.7	98.9
5/2	149269.88	149472	−202	1.249	$5d^76s6p(^4F)^4F$	15	0.5	98.4
3/2	149403.81	149321	83	1.531	$5d^76s6p(^4P)^6D$	14	2.5	96.7
7/2	151255.08	151116	139	1.271	$5d^76s6p(^4F)^6D$	13	0.6	98.3
9/2	151410.55	151374	37	1.267	$5d^76s6p(^2G)^4F$	23	0.1	99.4
5/2	152554.11	152632	−78	1.077	$5d^76s6p(^4F)^4G$	15	1.2	97.5
11/2		152793		1.144	$5d^76s6p(^2H)^4I$	23	0.1	99.5
3/2	153005.11	153098	−93	1.098	$5d^76s6p(^4F)^6G$	23	1.3	97.5
9/2	153569.56	153653	−84	1.054	$5d^76s6p(^2H)^4I$	24	0.2	99.4
7/2	154002.13	154265	−263	1.263	$5d^76s6p(^4F)^2F$	15	0.7	97.7
11/2		154407		1.290	$5d^76s6p(^4F)^6G$	41	—	99.4
1/2	154812.48	154747	65	1.038	$5d^76s6p(^2P)^2P$	19	1.7	97.4
5/2	155082.45	154979	103	1.348	$5d^76s6p(^4F)^6D$	17	0.9	97.2
3/2	155089.34	154983	106	1.268	$5d^76s6p(^4P)^4S$	17	2.8	95.5
7/2	155374.05	155414	−40	1.113	$5d^76s6p(^2G)^4H$	15	0.6	98.6
1/2	156492.36	156559	−67	1.626	$5d^76s6p(3^2D)^4P$	16	3.7	95.8
7/2	156533.06	156494	39	1.217	$5d^76s6p(^4F)^6D$	12	1.0	98.2
9/2	156606.12	156428	178	1.407	$5d^76s6p(^4P)^6D$	47	0.1	99.3
3/2	156851.35	156595	256	1.517	$5d^76s6p(^4P)^6P$	28	1.4	97.9
5/2	156942.81	156825	118	1.367	$5d^76s6p(^4P)^2D$	17	0.7	96.9
9/2	157424.92	157621	−196	1.280	$5d^76s6p(^4F)^4F^*$	19	0.4	98.8
7/2	157918.34	157787	131	1.449	$5d^76s6p(^4P)^6P$	35	2.2	96.0
3/2		157945		1.446	$5d^86p(^1S)^2P$	37	45.0	53.8
11/2	158129.68	157965	165	1.245	$5d^76s6p(^2H)^4G$	60	0.1	99.6

Table III. *Continued*

J	E_{exp}	E_{th}	ΔE	g_{th}	Leading comp.	%	$5d^86p$	$5d^76s6p$
5/2	158324.83	158369	−44	1.294	$5d^76s6p(^4F)^2D$	16	1.4	97.1
3/2		158417		1.500	$5d^86p(^1S)^2P$	38	45.9	52.8
13/2		158974		1.137	$5d^76s6p(^2H)^4I$	56	—	99.5
7/2	159076.16	159001	75	1.071	$5d^76s6p(^2G)^4H$	30	0.9	98.1
9/2		160191		1.179	$5d^76s6p(^4F)^4F$	17	0.7	98.4
11/2		160320		1.001	$5d^76s6p(^2H)^2I$	33	0.1	99.7
5/2	160408.73	160334	75	1.284	$5d^76s6p(^4F)^2D$	19	1.3	97.7
1/2		160482		1.793	$5d^76s6p(^4F)^6D$	29	2.7	95.3
7/2	160646.14	160651	−5	1.113	$5d^76s6p(^4F)^4F^*$	12	0.6	98.5
5/2		161232		1.000	$5d^76s6p(^2G)^4G$	21	0.8	97.8
9/2	162211.58	162214	−2	1.157	$5d^76s6p(^4F)^4G^*$	16	0.7	98.4
3/2	162770.58	163032	−161	0.998	$5d^76s6p(^4F)^4F^*$	17	1.5	96.3
5/2		163189		1.110	$5d^76s6p(^2F)^4G$	12	0.6	98.8
3/2		163290		1.181	$5d^76s6p(^4F)^4D^*$	12	0.7	97.7
5/2	163509.80	163650	−140	1.087	$5d^76s6p(^4F)^6G$	12	0.8	98.4
7/2	163711.27	163687	25	1.208	$5d^76s6p(^4P)^6D$	11	0.8	98.1
9/2	164132.97	163950	183	1.137	$5d^76s6p(^2H)^4G$	28	0.4	99.0
7/2	164267.83	164703	−435	1.153	$5d^76s6p(^4F)^4D^*$	29	1.6	97.1
11/2	164317.90	164165	153	1.217	$5d^76s6p(^4F)^4G$	41	0.4	98.7
13/2		164668		1.212	$5d^76s6p(^2G)^4H$	59	—	99.5
1/2		164986		1.414	$5d^76s6p(^2P)^4D$	22	2.1	96.4
9/2	165084.63	165238	−154	1.203	$5d^76s6p(^4F)^2G$	15	1.0	97.5
3/2	165177.09	164912	265	1.177	$5d^76s6p(^4P)^4D$	14	0.6	97.4
3/2		165586		1.024	$5d^76s6p(3^2D)^4F$	11	1.5	96.8
5/2	165760.77	165627	134	0.969	$5d^76s6p(^4F)^4G$	10	0.7	97.3
5/2		165926		1.249	$5d^76s6p(^2F)^4G$	10	0.7	97.6
7/2		166089		1.386	$5d^76s6p(^4P)^6P$	25	0.3	98.0
5/2		166441		1.082	$5d^76s6p(3^2D)^4F$	15	0.6	98.3
7/2	166267.70	166485	−217	1.266	$5d^76s6p(^4F)^4F^*$	12	0.7	97.9
1/2		166962		1.771	$5d^76s6p(^4F)^6D$	17	1.6	97.1
1/2		167204		1.060	$5d^76s6p(^2P)^4P$	22	1.3	96.9
9/2	167633.90	167631	3	1.137	$5d^76s6p(^2H)^4H$	26	0.3	98.0
11/2	167739.20	167765	−26	1.198	$5d^76s6p(^2G)^4G$	34	0.0	99.5
3/2		167828		1.205	$5d^76s6p(^2P)^4D$	15	2.1	95.9
7/2	167950.72	168093	−142	1.145	$5d^76s6p(^2F)^4G$	18	0.7	98.2
5/2		168436		1.385	$5d^76s6p(^4P)^6D$	20	0.7	97.6
3/2		168905		1.132	$5d^76s6p(^2F)^4F$	16	1.5	96.1
7/2	168900.69	168996	−95	1.116	$5d^76s6p(^4F)^2G$	15	0.4	98.5
15/2		169084		1.200	$5d^76s6p(^2H)^4I$	100	—	100.0
5/2	169759.94	169684	76	1.195	$5d^76s6p(^2F)^4F$	14	0.5	98.4
7/2		170212		1.133	$5d^76s6p(^4F)^2F$	20	0.2	98.7
3/2	170403.80	170458	−54	1.300	$5d^76s6p(^4P)^4D^*$	15	1.9	96.9
5/2		171074		1.210	$5d^76s6p(3^2D)^4P$	17	1.0	97.8
9/2		171450		0.930	$5d^76s6p(^2H)^4I$	36	0.9	98.2
1/2		171679		1.053	$5d^76s6p(^4P)^4D$	17	1.9	96.1
5/2	171844.60	171691	154	1.162	$5d^76s6p(^2G)^4F$	16	0.4	98.2
3/2		171906		1.070	$5d^76s6p(^4P)^2P$	13	1.1	96.1
5/2	172527.17	172396	131	1.083	$5d^76s6p(^2G)^4F$	11	1.4	97.2
3/2	172596.36	172480	117	1.236	$5d^76s6p(^4P)^4S^*$	12	1.6	97.4
5/2	173165.80	173450	−284	0.894	$5d^76s6p(^2F)^4G$	13	0.7	97.9
9/2	173182.00	173165	17	1.146	$5d^76s6p(^4F)^4G^*$	15	0.2	98.5
7/2	173225.26	172791	434	1.143	$5d^76s6p(^2H)^4G$	15	0.5	98.8
1/2		173318		1.055	$5d^76s6p(^2F)^4G$	13	1.9	95.2
11/2		173463		1.065	$5d^76s6p(^2H)^2I$	30	0.1	98.7
13/2		173514		1.194	$5d^76s6p(^2H)^4H$	70	—	98.4
3/2	173720.95	173581	140	1.185	$5d^76s6p(^4F)^4D^*$	13	1.1	97.7
7/2		174175		1.133	$5d^76s6p(^2G)^4G$	18	0.4	98.6
7/2	174380.45	174418	−38	1.230	$5d^76s6p(^2G)^4G$	14	0.6	98.0
9/2	174387.65	174469	−81	1.076	$5d^76s6p(^2G)^2H$	14	0.4	98.7
5/2	174975.25	174700	275	1.205	$5d^76s6p(^4P)^2D$	21	0.7	97.7
9/2		174796		1.182	$5d^76s6p(^2G)^4G$	16	0.2	99.0
7/2		175410		1.049	$5d^76s6p(^4F)^4G^*$	13	0.4	98.9
1/2		175451		0.868	$5d^76s6p(^2P)^2P^*$	14	2.6	92.7
3/2		175630		1.306	$5d^76s6p(^4P)^4S$	11	1.2	96.0
11/2	175858.20	175933	−75	1.143	$5d^76s6p(^2G)^2H^*$	25	0.6	97.5
		...						
5/2	177378.39	177751	−373	1.120	$5d^76s6p(^4F)^4D^*$	9	0.7	97.6
		...						
9/2	180102.67	180278	−105	1.132	$5d^76s6p(3^2D)^4F$	15	0.4	98.3
		...						

Table IV. *Energy levels of* $5d^87s + 5d^86d$ *in Au III*

J	E_{exp}	ΔE	First comp.	%	$5d^86d$ %	J	E_{exp}	ΔE	First comp.	%	$5d^86d$ %
9/2	161865.3	28	$7s\,^4F$	94	0.4	9/2	181192.8	35	$(^3F)\,^4G$	55	100.0
7/2	162925.1	37	$7s\,^2F$	65	0.6	7/2	181235.8	−13	$(^3F)\,^4F$	45	99.9
5/2	166441.8	−67	$(^3F)\,^4P$	51	96.0	5/2	181474.0	−74	$(^3F)\,^4G$	35	99.9
7/2	166836.9	6	$(^3F)\,^4D$	66	99.9	3/2	181781.4	23	$(^3F)\,^4P$	35	84.6
11/2	167328.0	46	$(^3F)\,^2H$	49	100.0	3/2	183630.8	17	$7s\,^4P$	59	21.6
9/2	167844.8	53	$(^3F)\,^4G$	37	99.8	1/2	183763.7	−21	$7s\,^2P$	53	34.5
13/2	168182.2	20	$(^3F)\,^4H$	94	100.0	3/2	185320.9	−33	$(^3P)\,^4F$	26	98.6
3/2	168221.4	41	$(^3F)\,^2P$	46	82.2	7/2	185433.5	−38	$(^3F)\,^4H$	33	99.1
5/2	168770.5	−31	$7s\,^2D$	41	9.9	3/2	185530.9	100	$(^3P)\,^4D$	32	98.3
7/2	168793.0	24	$(^3F)\,^2F$	59	99.7	5/2	186196.9	−16	$(^3P)\,^4D$	29	99.9
11/2	168793.2	102	$(^3F)\,^4G$	74	100.0	7/2	186311.5	−6	$(^3P)\,^4D$	43	99.9
3/2	169272.9	−30	$7s\,^2D$	39	18.5	1/2	186541.9	−311	$(^3F)\,^4P$	35	99.9
9/2	169426.6	39	$(^3F)\,^4F$	49	99.8	5/2	186556.9	−9	$(^3F)\,^2F$	15	99.7
5/2	170769.4	40	$(^3F)\,^2D$	28	94.1	9/2	186585.6	−44	$(^3P)\,^4F$	49	96.5
3/2	173435.4	−102	$(^1D)\,^2D$	40	99.2	5/2	187187.6	74	$(^3P)\,^2D$	28	99.9
5/2	173766.6	126	$(^1D)\,^2F$	38	95.9	3/2	187273.0	−29	$(^3P)\,^2D$	27	97.7
7/2	174090.8	−5	$(^1D)\,^2G$	20	88.0	9/2	187795.6	24	$7s\,^2G$	90	5.8
7/2	174483.3	−43	$7s\,^4F$	56	21.6	7/2	187861.7	49	$7s\,^2G$	91	3.5
5/2	174735.8	−28	$7s\,^4F$	57	6.0	5/2	189154.0	45	$(^3P)\,^4F$	40	99.6
7/2	175091.6	29	$(^1D)\,^2F$	26	90.7	3/2	189342.1	47	$(^3P)\,^4P$	42	99.0
3/2	175750.3	−187	$(^1D)\,^2P$	42	99.9	11/2	191972.7	−61	$(^1G)\,^2I$	93	100.0
5/2	176724.4	−45	$(^3F)\,^4F$	31	98.3	3/2	192866.0	69	$7s\,^2D$	48	3.9
3/2	179015.6	−47	$(^3F)\,^4D$	39	98.2	5/2	192920.8	−5	$7s\,^2D$	46	4.2
9/2	179594.6	−10	$(^3F)\,^4H$	57	100.0	13/2	193113.7	−31	$(^1G)\,^2I$	95	100.0
7/2	179878.9	24	$(^3F)\,^4G$	49	99.9	7/2	193391.5	−70	$(^1G)\,^2F$	77	99.3
1/2	180100.2	−51	$(^3F)\,^4D$	39	91.3	5/2	193832.0	−119	$(^1G)\,^2F$	79	98.5
5/2	180200.6	−55	$7s\,^4P$	35	26.5	9/2	194274.1	−63	$(^1G)\,^2H$	61	99.0
3/2	180410.9	−42	$7s\,^4F$	44	2.5	11/2	195428.5	−72	$(^1G)\,^2H$	94	100.0
5/2	180502.0	−55	$(^3F)\,^4D$	27	74.3	5/2	197945.3	76	$(^1D)\,^2D$	37	100.0
11/2	180648.8	−14	$(^3F)\,^4H$	63	100.0	7/2	198181.5	57	$(^1D)\,^2G$	39	100.0

Table V. *Fitted energy parameters for the configurations of Au III. Parameter values and standard errors are in* cm^{-1}

Parameter	Fitted value	Standard error	HXR	Fitted/HXR
$5d^9 + 5d^86s + 5d^76s^2$				
E av d^9	6192	135		
ζd	5165	57	5338	0.968
E av d^8s	49302	39		
F^2(dd)	56420	347	71843	0.785
F^4(dd)	42388	955	47736	0.888
α(dd)	19	7		
ζd	5424	23	5611	0.967
*G*2(ds)	16601	316	20669	0.803
E av d^7s^2	106939	107		
F^2(dd)	58139	613	73699	0.789
F^4(dd)	43244	748	49124	0.880
α(dd)	19	r1		
ζd	5655	46	5884	0.961
Configuration mixing				
$5d^9$–$5d^86s$	−20962	1037	−25919	0.809
$5d^9$–$5d^76s^2$	19324	r2	23037	0.839
$5d^86s$–$5d^76s^2$	−20992	r2	−26009	0.807
$5d^86p + 5d^76s6p(+5d^66s^26p + 5d^8\,7p + 5d^85f)$				
E av $5d^86p$	118169	172		
F^2(dd)	57207	590	72430	0.790
F^4(dd)	42925	970	48179	0.891
α(dd)	13	7		
ζd	5525	28	5680	0.973
ζp	8935	74	7623	1.172
F^2(dp)	20724	391	24382	0.850
G^1(dp)	8094	127	9994	0.810
G^3(dp)	7076	637	8250	0.858
E av $5d^76s6p$	175333	61		
F^2(dd)	57284	597	74201	0.772
F^4(dd)	43170	896	49504	0.872
α(dd)	13	r1		
ζd	5839	48	5948	0.982
ζp	10159	95	8902	1.141
F^2(dp)	24111	553	26110	0.923
G^1(dp)	8976	183	10453	0.859
G^3(dp)	6932	632	8793	0.788
G^2(ds)	17347	286	20845	0.832
*G*1(sp)	28212	342	45898	0.615
Configuration interaction				
$5d^86p$–$5d^76s6p$				
R^2(5d5d,5d6s)	−24113	992	−28368	
R^2(5d6p,6s6p)	−19681	r2	−23154	
R^1(5d6p,6p6s)	−12175	r2	−14995	
$5d^86p$–$5d^66s^26p$				
R^2(5d5d,6s6s)	18060	r2	21247	
$5d^76s6p$–$5d^66s^26p$				
R^2(5d5d,5d6s)	−24729	r2	−29093	
R^2(5d6p,6s6p)	−20183	r2	−23745	
R^1(5d6p,6p6s)	−12485	r2	−14688	
$5d^86d + 5d^87s$				
$A(d^8d)$	189641	135		
$A(d^8s)$	182200	53		
F^2(5d,5d)d^8s	54971	243	74161	0.741
F^2(5d,5d)d^8d	54962	132	14211	0.741
F^4(5d,5d)d^8s	44459	286	49496	0.898
F^4(5d,5d)d^8d	44459		49535	0.898
F^2(5d,6d)	7186	179	9670	0.743
G^0(5d,6d)	1485	53	1970	0.754
G^2(5d,6d)	1951	254	2424	0.804
G^4(5d,6d)	1505	333	1972	0.763
G^2(5d,7s)	2540	219	2583	0.983
ζ5d(d^8s)	5516	8	5609	0.983
ζ5d(d^8d)	5516		5615	0.982
ζ6d	494	11	334	1.479
Configuration interaction				
R^2(5d6d,5d7s)	−3189	291	−815	3.913
R^2(5d6d,7s5d)	−319	255	476	−0.670
α(5d,5d)	26	1.4		
α(5d,6d)	4	1.9		

Note: r1-all α parameters are assumed to be equal in the optimization process. r2-configuration interaction parameters were held in a constant ratio.

Table VI. *Theoretical transition probabilities for the odd parity levels of Au III with energies lower than 125 000 cm^{-1} (gA larger than 10^8 s^{-1}). The classifications of the lines are given in Table I*

λ exp (Å)	Int	gA (10^8 s^{-1})	λ exp (Å)	Int	gA (10^8 s^{-1})	λ exp (Å)	Int	gA (10^8 s^{-1})
1918.270	60	1.110	1584.076	200	1.929	1336.707	950	97.87
1880.901	70	1.238	1581.237	100	1.091	1322.739	400	1.696
1871.917	80	1.379	1579.413	300	5.300	1314.833	600	11.20
1861.792	300	5.087	1574.847	400	8.892	1306.402	300	5.624
1850.127	200	4.137	1571.885	150	1.766 p	1306.306	300	2.267
1848.836	70	1.991	1567.513	400	6.783 p	1302.254	300	2.349
1844.887	250	6.987	1563.830	120	1.211	1291.983	500	19.77
1841.024	20	1.506	1562.424	600	7.730	1290.798	400	13.30
1821.172	300	6.799	1560.562	80	1.678	1290.016	300	7.506
1809.813	100	1.816	1556.804	100	1.780	1285.297	200	6.269
1805.239	300	5.583	1554.568	300	7.591	1280.907	300	9.463
1801.975	300	7.761	1541.969	150	7.738	1278.521	400	18.20
1793.759	400	14.60	1528.940	300	2.308	1254.997	200	5.334
1792.646	150	4.968	1503.716	500	15.38	1245.884	300	1.932
1786.105	300	12.56	1502.438	600	8.989	1239.975	600	29.24
1780.573	100	3.018	1500.343	800	32.27	1231.452	70	2.192
1776.395	150	5.535	1494.271	120	2.127	1231.273	300	13.43
1775.167	600	38.40	1489.442	700	12.59	1231.065	200	4.521
1774.419	100	5.155	1487.913	900	27.29	1218.600	100	2.228
1767.409	200	8.692	1487.130	900	38.91	1204.150	400	1.158
1761.944	500	50.19	1482.513	200	2.250	1185.436	50	2.494
1760.879	60	1.123	1474.700	500	14.78	1177.157	60	3.551
1756.920	500	19.45	1473.286	300	3.735	1152.746	100	2.025
1750.102	150	5.097	1471.296	500	24.58	1143.469	30	1.945
1746.057	700	21.21	1464.696	600	13.56	1129.043	40	2.258
1745.127	400	4.071	1462.055	200	4.503	1086.109	100	2.896
1744.349	400	4.528	1454.932	800	16.05	1054.184	130	1.806
1738.480	600	18.87	1448.402	800	21.36	1046.818	300	2.549
1736.638	150	1.379	1446.715	300	5.652	1044.494	300	1.146
1736.567	20	2.935	1439.105	900	46.56	1040.639	800	2.928
1733.113	200	5.004	1436.800	500	11.04	1034.196	300	4.179
1732.826	40	1.049	1436.083	600	8.208	989.402	150	2.321
1727.279	600	17.89	1433.348	800	84.31	973.897	400	1.378
1726.953	70	1.500	1428.911	900	110.0	945.100	900	30.07
1717.797	400	9.208	1427.396	600	25.42	944.582	500	2.886
1716.684	200	2.611	1419.028	400	8.599	941.058	200	2.078
1715.670	300	14.87	1417.373	700	27.79	931.678	90	1.322
1710.118	400	19.27	1417.127	700	5.785	929.764	100	3.523
1707.505	200	5.902	1413.781	900	46.39	924.028	900	44.81
1702.243	200	4.739	1409.477	900	53.13	915.337	50	2.274
1699.983	200	4.242	1406.082	200	5.558	911.470	600	9.506
1698.963	200	1.596	1391.443	800	25.51	910.447	800	27.04
1697.075	200	3.704	1389.393	600	18.92	905.100	400	8.742
1693.930	800	54.64	1385.768	900	91.89	901.022	800	20.84
1676.965	150	1.479	1380.494	500	7.846	885.900	800	139.2
1673.921	200	7.195	1379.953	400	9.789	859.894	160	14.91
1668.098	400	4.046	1379.221	350	2.223	855.492	600	51.76
1664.769	600	16.32	1378.663	600	9.225	845.135	800	165.7
1652.733	600	32.34	1378.165	700	11.92	843.449	700	53.33
1644.195	250	4.864	1378.052	700	1.485	833.146	500	33.94
1638.870	600	5.456	1377.713	800	37.99	820.848	120	2.485 2
1632.893	200	2.319	1367.158	900	30.90	820.050	160	25.85
1629.116	500	14.05 1	1365.947	600	2.964	816.127	10	2.084
1621.915	800	38.66	1365.382	990	199.1	811.830	100	37.88
1617.765	200	2.527	1362.045	600	16.32			
1617.143	400	14.30	1356.117	700	37.30			
1600.491	500	18.44	1353.206	600	12.11			
1593.402	400	11.90	1350.307	600	19.26			
1589.670	200	3.094	1348.879	600	15.29			
1589.570	300	18.58	1346.136	400	2.308			

Notes: 1-Blend with the transition 40345–101728 ($gA = 3.676 \times 10^8$ s^{-1}), 2-Blend with the transition 38822–160646, p–perturbed by a close line.