

STARK BROADENING PARAMETER TABLES FOR In II (Part II)

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SUMMARY: Electron-, proton-, and ionized helium-impact broadening parameter tables for 101 In II multiplets, are presented as a function of temperature for the perturber density of 10^{16} cm^{-3} . Calculations have been performed within the semiclassical perturbation approach.

1. INTRODUCTION

Recently (Dimitrijević and Sahal–Bréchet, 2001a), we have published electron-, proton-, and He II impact line widths (full width at half maximum) and shifts for 145 In II multiplets for perturber densities of $10^{13} - 10^{15} \text{ cm}^{-3}$ and $10^{17} - 10^{19} \text{ cm}^{-3}$ and temperatures $T = 5000 \text{ K}, 10000 \text{ K}, 20000 \text{ K}, 30000 \text{ K}, 50000 \text{ K}$ and 100000 K . Calculations have been performed within the semiclassical-perturbation formalism (Sahal–Bréchet, 1969ab, see also Sahal–Bréchet, 1974, Fleurier *et al.*, 1977, Dimitrijević and Sahal–Bréchet, 1984, Dimitrijević *et al.* 1991, Dimitrijević and Sahal–Bréchet, 1995) In order to complete our results, here will be presented the data for the perturber density of 10^{17} cm^{-3} and for the same temperatures as in Dimitrijević and Sahal–Bréchet (2001a).

2. RESULTS AND DISCUSSION

All relevant details concerning the obtained results and the calculation procedure, as well as the discussion of the obtained results and comparison with experimental (N'Dollo and Fabry, 1987) and other theoretical data (N'Dollo and Fabry, 1987, Lakićević, 1983) will be published in Dimitrijević and Sahal–Bréchet, 2001b. Here, we present only tables of Stark broadening parameters. Atomic energy levels needed for calculations have been taken from Moore (1971). Our results for 101 In II multiplets are shown in Table 1, for perturber density of 10^{16} cm^{-3} . The temperature range is $T = 5000 - 100000 \text{ K}$. We also specify a parameter C (Dimitrijević and Sahal–Bréchet 1984), which gives an estimate for the maximum perturber density for which the line may be treated as isolated when divided by the

Table 1. This Table shows electron-, proton-, and He II- impact broadening parameters for In II for perturber density of 10^{16}cm^{-3} and temperatures from 5 000 up to 100 000 K. Transitions and averaged wavelengths for the multiplet (in Å) are also given. By dividing C by the corresponding full width at half maximum (Dimitrijević *et al.*, 1991), we obtain an estimate for the maximum perturber density for which the line may be treated as isolated and tabulated data may be used. The asterisk identifies cases for which the collision volume multiplied by the perturber density (the condition for validity of the impact approximation) lies between 0.1 and 0.5.

PERTURBERS ARE:		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
PERTURBER DENSITY = $1.E+16\text{cm}^{-3}$							
In II 5S-5P 1586.5 Å C=0.86E+19	5000. 10000. 20000. 30000. 50000. 100000.	0.690E-02 0.471E-02 0.340E-02 0.284E-02 0.228E-02 0.177E-02	-0.384E-03 -0.390E-03 -0.205E-03 -0.180E-03 -0.165E-03 -0.129E-03	0.133E-03 0.274E-03 0.428E-03 0.522E-03 0.595E-03 0.673E-03	-0.373E-05 -0.805E-05 -0.162E-04 -0.233E-04 -0.338E-04 -0.485E-04	0.219E-03 0.380E-03 0.532E-03 0.589E-03 0.646E-03 0.720E-03	-0.373E-05 -0.803E-05 -0.157E-04 -0.217E-04 -0.302E-04 -0.417E-04
In II 5S-6P 911.0 Å C=0.34E+18	5000. 10000. 20000. 30000. 50000. 100000.	0.951E-02 0.762E-02 0.651E-02 0.612E-02 0.572E-02 0.520E-02	0.348E-02 0.263E-02 0.199E-02 0.175E-02 0.150E-02 0.117E-02	0.571E-03 0.844E-03 0.105E-02 0.115E-02 0.128E-02 0.143E-02	0.277E-03 0.435E-03 0.583E-03 0.660E-03 0.753E-03 0.885E-03	0.696E-03 0.931E-03 0.108E-02 0.116E-02 0.126E-02 0.136E-02	0.247E-03 0.373E-03 0.479E-03 0.540E-03 0.611E-03 0.713E-03
In II 5S-7P 783.9 Å C=0.55E+17	5000. 10000. 20000. 30000. 50000. 100000.	0.239E-01 0.202E-01 0.179E-01 0.170E-01 0.160E-01 0.145E-01	-0.102E-01 -0.849E-02 -0.681E-02 -0.603E-02 -0.528E-02 -0.423E-02	*0.224E-02 *0.287E-02 *0.345E-02 *0.387E-02 0.420E-02 0.492E-02	-0.143E-02 -0.197E-02 -0.253E-02 -0.288E-02 -0.316E-02 -0.364E-02	*0.224E-02 *0.276E-02 *0.324E-02 *0.349E-02 *0.370E-02 *0.406E-02	-0.112E-02 -0.157E-02 -0.203E-02 -0.229E-02 -0.252E-02 -0.289E-02
In II 5S-8P 734.8 Å C=0.38E+17	5000. 10000. 20000. 30000. 50000. 100000.	0.406E-01 0.348E-01 0.313E-01 0.302E-01 0.291E-01 0.270E-01	-0.211E-01 -0.176E-01 -0.143E-01 -0.126E-01 -0.109E-01 -0.865E-02	*0.705E-02 *0.759E-02 *0.812E-02 *0.917E-02	-0.466E-02 -0.528E-02 -0.587E-02 -0.657E-02	*0.786E-02	-0.517E-02
In II 5S-9P 710.0 Å C=0.22E+17	5000. 10000. 20000. 30000. 50000. 100000.	*0.745E-01 0.647E-01 0.596E-01 0.585E-01 0.568E-01 0.531E-01	-0.387E-01 -0.330E-01 -0.288E-01 -0.257E-01 -0.218E-01 -0.170E-01				
In II 6S-6P 7843.1 Å C=0.25E+20	5000. 10000. 20000. 30000. 50000. 100000.	0.849 0.678 0.572 0.530 0.498 0.456	0.131 0.953E-01 0.596E-01 0.608E-01 0.480E-01 0.357E-01	0.414E-01 0.609E-01 0.748E-01 0.818E-01 0.902E-01 0.998E-01	0.169E-01 0.268E-01 0.372E-01 0.420E-01 0.478E-01 0.563E-01	0.509E-01 0.680E-01 0.782E-01 0.841E-01 0.906E-01 0.958E-01	0.153E-01 0.232E-01 0.302E-01 0.342E-01 0.390E-01 0.454E-01
In II 6S-7P 3274.1 Å C=0.97E+18	5000. 10000. 20000. 30000. 50000. 100000.	0.450 0.376 0.329 0.311 0.293 0.266	-0.192 -0.162 -0.133 -0.118 -0.104 -0.842E-01	*0.394E-01 *0.502E-01 *0.605E-01 *0.678E-01 0.738E-01 0.871E-01	-0.251E-01 -0.346E-01 -0.445E-01 -0.506E-01 -0.559E-01 -0.642E-01	*0.392E-01 *0.484E-01 *0.563E-01 *0.607E-01 *0.647E-01 *0.710E-01	-0.198E-01 -0.276E-01 -0.356E-01 -0.403E-01 -0.444E-01 -0.509E-01
In II 6S-8P 2559.7 Å C=0.46E+18	5000. 10000. 20000. 30000. 50000. 100000.	0.512 0.436 0.390 0.375 0.362 0.336	-0.260 -0.217 -0.179 -0.159 -0.138 -0.109	*0.856E-01 *0.923E-01 *0.990E-01 *0.112	-0.567E-01 -0.643E-01 -0.717E-01 -0.801E-01	*0.949E-01	-0.627E-01
In II 6S-9P 2282.3 Å C=0.23E+18	5000. 10000. 20000. 30000. 50000. 100000.	*0.784 0.679 0.623 0.612 0.594 0.555	-0.401 -0.343 -0.301 -0.269 -0.230 -0.180				

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 7S-8P 7859.1 Å C=0.43E+19	5000.	5.49	-2.83				
	10000.	4.68	-2.51				
	20000.	4.18	-2.07	*0.848	-0.566		
	30000.	4.01	-1.86	*0.904	-0.639		
	50000.	3.86	-1.62	*1.00	-0.716		
	100000.	3.58	-1.28	*1.03	-0.774	*0.919	-0.624
In II 7S-9P 5723.4 Å C=0.14E+19	5000.	*5.16	-2.67				
	10000.	4.48	-2.34				
	20000.	4.14	-2.07				
	30000.	4.07	-1.87				
	50000.	3.96	-1.61				
	100000.	3.70	-1.26				
In II 5P-6S 2941.9 Å C=0.11E+20	5000.	0.564E-01	0.246E-01	0.549E-03	0.700E-03	0.844E-03	0.665E-03
	10000.	0.405E-01	0.184E-01	0.124E-02	0.128E-02	0.152E-02	0.114E-02
	20000.	0.287E-01	0.143E-01	0.206E-02	0.188E-02	0.226E-02	0.161E-02
	30000.	0.236E-01	0.120E-01	0.262E-02	0.225E-02	0.255E-02	0.183E-02
	50000.	0.201E-01	0.103E-01	0.313E-02	0.259E-02	0.294E-02	0.210E-02
	100000.	0.168E-01	0.833E-02	0.379E-02	0.307E-02	0.347E-02	0.251E-02
In II 5P-7S 1657.4 Å C=0.12E+19	5000.	0.619E-01	0.290E-01	0.140E-02	0.200E-02	0.132E-02	0.168E-02
	10000.	0.428E-01	0.253E-01	0.249E-02	0.302E-02	0.239E-02	0.245E-02
	20000.	0.327E-01	0.205E-01	0.370E-02	0.381E-02	0.318E-02	0.310E-02
	30000.	0.291E-01	0.197E-01	0.432E-02	0.434E-02	0.362E-02	0.350E-02
	50000.	0.262E-01	0.168E-01	0.509E-02	0.488E-02	0.424E-02	0.398E-02
	100000.	0.229E-01	0.135E-01	0.630E-02	0.571E-02	0.506E-02	0.456E-02
In II 5P-8S 1418.1 Å C=0.51E+18	5000.	0.752E-01	0.363E-01	0.291E-02	0.344E-02	*0.282E-02	*0.283E-02
	10000.	0.538E-01	0.351E-01	0.478E-02	0.482E-02	*0.409E-02	*0.388E-02
	20000.	0.448E-01	0.295E-01	0.627E-02	0.619E-02	*0.522E-02	*0.502E-02
	30000.	0.418E-01	0.267E-01	0.715E-02	0.705E-02	0.614E-02	0.564E-02
	50000.	0.371E-01	0.244E-01	0.833E-02	0.791E-02	0.689E-02	0.621E-02
	100000.	0.338E-01	0.196E-01	0.101E-01	0.886E-02	0.782E-02	0.713E-02
In II 5P-9S 1309.8 Å C=0.25E+18	5000.	0.122	0.620E-01	*0.810E-02	*0.686E-02		
	10000.	0.937E-01	0.621E-01	*0.109E-01	*0.971E-02	*0.897E-02	*0.765E-02
	20000.	0.800E-01	0.540E-01	*0.139E-01	*0.127E-01	*0.113E-01	*0.100E-01
	30000.	0.753E-01	0.491E-01	*0.153E-01	*0.144E-01	*0.126E-01	*0.113E-01
	50000.	0.703E-01	0.446E-01	*0.177E-01	*0.159E-01	*0.136E-01	*0.127E-01
	100000.	0.657E-01	0.365E-01	*0.205E-01	*0.180E-01	*0.166E-01	*0.147E-01
In II 6P-7S 7356.9 Å C=0.22E+20	5000.	1.13	0.465	0.404E-01	0.274E-01	0.477E-01	0.231E-01
	10000.	0.898	0.366	0.615E-01	0.414E-01	0.647E-01	0.349E-01
	20000.	0.789	0.286	0.778E-01	0.539E-01	0.763E-01	0.440E-01
	30000.	0.768	0.256	0.861E-01	0.608E-01	0.836E-01	0.498E-01
	50000.	0.748	0.218	0.968E-01	0.691E-01	0.914E-01	0.561E-01
	100000.	0.712	0.175	0.112	0.805E-01	0.981E-01	0.640E-01
In II 6P-8S 4206.3 Å C=0.45E+19	5000.	0.641	0.320	0.269E-01	0.277E-01	*0.276E-01	*0.228E-01
	10000.	0.486	0.273	0.420E-01	0.389E-01	*0.381E-01	*0.314E-01
	20000.	0.439	0.222	0.547E-01	0.500E-01	*0.475E-01	*0.403E-01
	30000.	0.413	0.205	0.614E-01	0.566E-01	0.526E-01	0.461E-01
	50000.	0.393	0.178	0.719E-01	0.625E-01	0.598E-01	0.511E-01
	100000.	0.376	0.143	0.854E-01	0.733E-01	0.682E-01	0.577E-01
In II 6P-9S 3377.6 Å C=0.17E+19	5000.	0.825	0.398	*0.537E-01	*0.447E-01		
	10000.	0.635	0.391	*0.714E-01	*0.636E-01	*0.599E-01	*0.494E-01
	20000.	0.560	0.337	*0.903E-01	*0.829E-01	*0.752E-01	*0.652E-01
	30000.	0.538	0.304	*0.991E-01	*0.931E-01	*0.846E-01	*0.736E-01
	50000.	0.509	0.275	*0.114	*0.103	*0.901E-01	*0.817E-01
	100000.	0.486	0.224	*0.135	*0.119	*0.110	*0.952E-01
In II 7P-8S 16720.8 Å C=0.25E+20	5000.	20.1	8.40	*1.29	*0.910		
	10000.	16.5	7.77	*1.66	*1.26		
	20000.	14.1	6.95	*2.03	*1.63	*1.82	*1.31
	30000.	13.2	6.33	*2.24	*1.84	*1.96	*1.49
	50000.	12.4	5.62	*2.55	*2.07	*2.18	*1.65
	100000.	11.2	4.65	2.83	2.31	*2.22	*1.81

PERTURBERS ARE: TRANSITION		ELECTRONS		PROTONS		IONIZED HELIUM	
	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 7P-9S 8464.5 Å C=0.65E+19	5000.	7.56	2.96	*0.489	*0.352		
	10000.	6.24	2.96	*0.638	*0.511		
	20000.	5.38	2.92	*0.803	*0.678		
	30000.	5.06	2.67	*0.889	*0.764		
	50000.	4.80	2.33	*1.01	*0.844	*0.808	*0.661
	100000.	4.43	2.01	*1.05	*0.957	*0.890	*0.734
In II 5P-5D 1966.7 Å C=0.16E+19	5000.	0.476E-01	-0.231E-03	0.250E-02	-0.574E-03	0.313E-02	-0.525E-03
	10000.	0.366E-01	-0.581E-03	0.365E-02	-0.983E-03	0.415E-02	-0.835E-03
	20000.	0.295E-01	-0.905E-03	0.440E-02	-0.140E-02	0.473E-02	-0.116E-02
	30000.	0.266E-01	-0.115E-02	0.477E-02	-0.159E-02	0.506E-02	-0.131E-02
	50000.	0.240E-01	-0.753E-03	0.521E-02	-0.182E-02	0.539E-02	-0.149E-02
	100000.	0.212E-01	-0.764E-03	0.566E-02	-0.217E-02	0.564E-02	-0.177E-02
In II 5P-6D 1571.5 Å C=0.22E+18	5000.	0.662E-01	0.458E-02	0.560E-02	0.324E-02	*0.616E-02	*0.271E-02
	10000.	0.580E-01	0.617E-02	0.739E-02	0.464E-02	*0.745E-02	*0.374E-02
	20000.	0.532E-01	0.520E-02	0.893E-02	0.591E-02	*0.866E-02	*0.478E-02
	30000.	0.508E-01	0.503E-02	0.977E-02	0.670E-02	*0.921E-02	*0.542E-02
	50000.	0.481E-01	0.506E-02	0.108E-01	0.754E-02	0.997E-02	0.607E-02
	100000.	0.437E-01	0.405E-02	0.122E-01	0.868E-02	0.110E-01	0.708E-02
In II 5P-7D 1381.9 Å C=0.13E+18	5000.	0.925E-01	0.481E-02	*0.111E-01	*0.437E-02		
	10000.	0.851E-01	0.692E-02	*0.133E-01	*0.605E-02		
	20000.	0.839E-01	0.526E-02	*0.154E-01	*0.770E-02		
	30000.	0.839E-01	0.517E-02	*0.163E-01	*0.879E-02	*0.155E-01	*0.706E-02
	50000.	0.832E-01	0.506E-02	*0.173E-01	*0.966E-02	*0.163E-01	*0.770E-02
	100000.	0.794E-01	0.346E-02	0.191E-01	0.112E-01	*0.172E-01	*0.884E-02
In II 5P-8D 1292.5 Å C=0.73E+17	5000.	0.150	0.894E-02				
	10000.	0.148	0.550E-02				
	20000.	0.151	0.603E-02				
	30000.	0.154	0.648E-02	*0.297E-01	*0.153E-01		
	50000.	0.157	0.501E-02	*0.311E-01	*0.170E-01		
	100000.	0.151	0.334E-02	*0.340E-01	*0.193E-01		
In II 5P-9D 1243.1 Å C=0.43E+17	5000.	*0.247	*0.993E-02				
	10000.	*0.254	*0.435E-02				
	20000.	0.269	0.505E-02				
	30000.	0.277	0.647E-02				
	50000.	0.284	0.381E-02				
	100000.	0.275	0.318E-02				
In II 6P-6D 5920.4 Å C=0.32E+19	5000.	1.18	-0.326E-01	0.871E-01	0.395E-01	*0.962E-01	*0.333E-01
	10000.	1.02	-0.263E-02	0.111	0.582E-01	*0.114	*0.465E-01
	20000.	0.939	0.287E-02	0.131	0.736E-01	*0.131	*0.596E-01
	30000.	0.903	0.158E-02	0.144	0.837E-01	*0.138	*0.674E-01
	50000.	0.857	0.792E-02	0.154	0.933E-01	*0.145	*0.751E-01
	100000.	0.785	0.750E-02	0.170	0.107	0.153	0.855E-01
In II 6P-7D 3903.2 Å C=0.11E+19	5000.	0.827	-0.110E-01	*0.911E-01	*0.328E-01		
	10000.	0.757	0.184E-02	*0.109	*0.453E-01		
	20000.	0.745	0.190E-02	*0.125	*0.580E-01		
	30000.	0.744	0.290E-02	*0.131	*0.656E-01	*0.128	*0.533E-01
	50000.	0.736	0.890E-02	*0.139	*0.736E-01	*0.131	*0.584E-01
	100000.	0.702	0.308E-02	0.153	0.854E-01	*0.137	*0.665E-01
In II 6P-8D 3265.0 Å C=0.47E+18	5000.	1.00	0.205E-01				
	10000.	0.991	0.792E-02				
	20000.	1.02	0.161E-02				
	30000.	1.03	0.926E-02	*0.190	*0.963E-01		
	50000.	1.05	0.795E-02	*0.201	*0.107		
	100000.	1.01	0.246E-02	*0.219	*0.123		
In II 6P-9D 2967.0 Å C=0.25E+18	5000.	*1.44	*0.267E-01				
	10000.	*1.48	*0.145E-01				
	20000.	1.57	0.295E-02				
	30000.	1.62	0.104E-01				
	50000.	1.66	0.116E-02				
	100000.	1.60	0.315E-02				

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 7P-7D 12776.1 Å C=0.11E+20	5000.	12.1	3.08				
	10000.	11.2	2.79	*1.53	*0.822		
	20000.	10.8	2.22	*1.78	*1.07		
	30000.	10.8	1.98	*1.91	*1.20		
	50000.	10.6	1.79	*2.03	*1.32	*1.85	*1.05
	100000.	10.0	1.40	*2.24	*1.51	*2.05	*1.26
In II 7P-8D 7791.2 Å C=0.26E+19	5000.	*6.75	*1.14				
	10000.	6.58	0.956				
	20000.	6.73	0.808				
	30000.	6.87	0.780				
	50000.	6.92	0.677	*1.29	*0.753		
	100000.	6.66	0.517	*1.41	*0.887		
In II 7P-9D 6285.1 Å C=0.11E+19	5000.	*7.03	*0.724				
	10000.	*7.20	*0.569				
	20000.	7.63	0.554				
	30000.	7.88	0.532				
	50000.	8.03	0.416				
	100000.	7.77	0.345				
In II 5D-6P 24362.4 Å C=0.24E+21	5000.	11.4	3.24	0.671	0.265	*0.820	*0.226
	10000.	9.10	2.29	0.950	0.403	1.01	0.342
	20000.	7.75	1.58	1.11	0.527	1.15	0.431
	30000.	7.27	1.45	1.21	0.597	1.23	0.486
	50000.	6.79	1.23	1.32	0.683	1.30	0.553
	100000.	6.18	0.939	1.44	0.790	1.37	0.634
In II 5D-7P 7305.4 Å C=0.48E+19	5000.	2.36	-0.789	*0.206	-0.122		
	10000.	1.99	-0.676	*0.260	-0.168	*0.254	-0.134
	20000.	1.77	-0.554	*0.310	-0.214	*0.295	-0.174
	30000.	1.69	-0.494	*0.343	-0.245	*0.315	-0.197
	50000.	1.60	-0.435	0.373	-0.268	*0.330	-0.214
	100000.	1.46	-0.354	0.433	-0.313	*0.359	-0.244
In II 5D-8P 4502.1 Å C=0.14E+19	5000.	1.61	-0.764				
	10000.	1.39	-0.636				
	20000.	1.25	-0.519	*0.268	-0.173		
	30000.	1.21	-0.460	*0.289	-0.197		
	50000.	1.17	-0.399	*0.306	-0.217		
	100000.	1.09	-0.318	*0.347	-0.245	*0.300	-0.193
In II 5D-9P 3709.2 Å C=0.60E+18	5000.	*2.10	-1.05				
	10000.	1.82	-0.889				
	20000.	1.68	-0.776				
	30000.	1.65	-0.692				
	50000.	1.60	-0.588				
	100000.	1.50	-0.460				
In II 6D-8P 10609.0 Å C=0.78E+19	5000.	10.7	-4.86				
	10000.	9.30	-4.07				
	20000.	8.43	-3.33	*1.66	-1.08		
	30000.	8.13	-2.92	*1.75	-1.21		
	50000.	7.86	-2.51	*1.94	-1.34		
	100000.	7.28	-2.00	*2.04	-1.54	*1.71	-1.18
In II 6D-9P 7055.2 Å C=0.22E+19	5000.	*8.31	-3.99				
	10000.	7.27	-3.39				
	20000.	6.74	-2.99				
	30000.	6.61	-2.66				
	50000.	6.41	-2.26				
	100000.	5.97	-1.77				
In II 5D-4F 10189.5 Å C=0.31E+20	5000.	2.26	0.313	0.159	0.426E-01	*0.192	*0.369E-01
	10000.	1.78	0.223	0.213	0.655E-01	*0.229	*0.555E-01
	20000.	1.48	0.163	0.245	0.857E-01	0.258	0.703E-01
	30000.	1.35	0.148	0.263	0.976E-01	0.273	0.797E-01
	50000.	1.23	0.122	0.283	0.111	0.284	0.903E-01
	100000.	1.10	0.950E-01	0.298	0.129	0.293	0.105

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 5D-5F 4975.2 Å C=0.13E+19	5000.	1.72	0.893	*0.176	*0.115		
	10000.	1.49	0.729	*0.225	*0.167		
	20000.	1.36	0.587	*0.272	*0.219		
	30000.	1.32	0.520	*0.300	*0.248		
	50000.	1.27	0.445	*0.333	*0.279	*0.282	*0.214
100000.	1.17	0.347	*0.385	*0.305	*0.312	*0.243	
In II 5D-6F 3890.9 Å C=0.51E+18	5000.	*2.16	*1.16				
	10000.	1.88	1.02				
	20000.	1.74	0.839				
	30000.	1.71	0.745				
	50000.	1.67	0.630				
100000.	1.55	0.489					
In II 5D-7F 3439.4 Å C=0.27E+18	5000.	*3.09	*1.68				
	10000.	*2.77	*1.49				
	20000.	*2.65	*1.30				
	30000.	2.61	1.15				
	50000.	2.55	0.974				
100000.	2.37	0.757					
In II 5D-8F 3199.0 Å C=0.16E+18	5000.						
	10000.	*4.17	*2.20				
	20000.	*4.10	*1.88				
	30000.	*4.06	*1.74				
	50000.	*3.94	*1.47				
100000.	3.68	1.16					
In II 5D-9F 3053.1 Å C=0.11E+18	5000.						
	10000.						
	20000.						
	30000.	*6.17	*2.51				
	50000.	*5.98	*2.14				
100000.	*5.59	*1.72					
In II 6D-6F 7742.9 Å C=0.20E+19	5000.	*8.78	*4.53				
	10000.	7.82	3.77				
	20000.	7.47	3.09				
	30000.	7.41	2.76				
	50000.	7.26	2.33				
100000.	6.78	1.81					
In II 6D-7F 6139.2 Å C=0.86E+18	5000.	*10.00	*5.21				
	10000.	*9.09	*4.60				
	20000.	*8.77	*4.00				
	30000.	8.70	3.53				
	50000.	8.50	3.00				
100000.	7.95	2.33					
In II 6D-8F 5413.2 Å C=0.47E+18	5000.						
	10000.	*12.1	*6.18				
	20000.	*12.0	*5.28				
	30000.	*11.9	*4.89				
	50000.	*11.6	*4.13				
100000.	10.8	3.27					
In II 6D-9F 5008.2 Å C=0.29E+18	5000.						
	10000.						
	20000.						
	30000.	*16.8	*6.68				
	50000.	*16.3	*5.68				
100000.	*15.3	*4.58					
In II 4F-7D 8545.9 Å C=0.51E+19	5000.	4.10	0.131	*0.450	*0.158		
	10000.	3.70	0.210	*0.536	*0.219		
	20000.	3.61	0.138	*0.615	*0.280		
	30000.	3.58	0.131	*0.646	*0.317	*0.631	*0.257
	50000.	3.52	0.137	*0.685	*0.356	*0.643	*0.283
100000.	3.34	0.798E-01	*0.751	*0.415	*0.679	*0.319	

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 4F-8D 5984.6 Å C=0.16E+19	5000.	3.46	0.128				
	10000.	3.38	0.620E-01				
	20000.	3.43	0.570E-01				
	30000.	3.48	0.827E-01	*0.645	*0.324		
	50000.	3.52	0.725E-01	*0.677	*0.362		
	100000.	3.39	0.401E-01	*0.738	*0.413		
In II 4F-9D 5054.3 Å C=0.71E+18	5000.	*4.24	*0.111				
	10000.	*4.33	*0.710E-01				
	20000.	4.57	0.433E-01				
	30000.	4.71	0.680E-01				
	50000.	4.80	0.318E-01				
	100000.	4.65	0.322E-01				
In II 5F-6D 13673.0 Å C=0.99E+19	5000.	14.1	-5.65	*1.30	-0.791		
	10000.	12.8	-4.57	*1.63	-1.13		
	20000.	12.3	-3.71	*1.98	-1.48		
	30000.	12.1	-3.31	*2.19	-1.67		
	50000.	11.7	-2.83	*2.38	-1.86	*2.08	-1.51
	100000.	10.9	-2.24	*2.78	-2.14	*2.34	-1.65
In II 6S-6P 7029.8 Å C=0.29E+20	5000.	0.735	-0.259	0.292E-01	-0.952E-02	0.366E-01	-0.869E-02
	10000.	0.543	-0.199	0.432E-01	-0.157E-01	0.494E-01	-0.136E-01
	20000.	0.410	-0.154	0.531E-01	-0.223E-01	0.565E-01	-0.181E-01
	30000.	0.354	-0.135	0.579E-01	-0.250E-01	0.607E-01	-0.205E-01
	50000.	0.306	-0.116	0.638E-01	-0.287E-01	0.651E-01	-0.235E-01
	100000.	0.258	-0.931E-01	0.700E-01	-0.343E-01	0.693E-01	-0.275E-01
In II 6S-7P 3011.3 Å C=0.21E+19	5000.	0.284	-0.117	*0.252E-01	-0.849E-02	*0.278E-01	-0.723E-02
	10000.	0.216	-0.912E-01	0.312E-01	-0.128E-01	*0.329E-01	-0.102E-01
	20000.	0.181	-0.754E-01	0.360E-01	-0.161E-01	*0.370E-01	-0.130E-01
	30000.	0.167	-0.669E-01	0.388E-01	-0.182E-01	*0.386E-01	-0.148E-01
	50000.	0.153	-0.573E-01	0.409E-01	-0.205E-01	*0.401E-01	-0.163E-01
	100000.	0.138	-0.472E-01	0.449E-01	-0.239E-01	0.420E-01	-0.191E-01
In II 6S-8P 2380.1 Å C=0.67E+18	5000.	0.361	-0.163				
	10000.	0.293	-0.136	*0.536E-01	-0.236E-01		
	20000.	0.257	-0.119	*0.605E-01	-0.304E-01		
	30000.	0.243	-0.106	*0.642E-01	-0.348E-01		
	50000.	0.232	-0.909E-01	*0.674E-01	-0.380E-01	*0.647E-01	-0.304E-01
	100000.	0.217	-0.738E-01	*0.744E-01	-0.445E-01	*0.652E-01	-0.344E-01
In II 6S-9P 2134.0 Å C=0.27E+18	5000.	*0.585	-0.291				
	10000.	0.502	-0.252				
	20000.	0.458	-0.224				
	30000.	0.447	-0.197				
	50000.	0.437	-0.172				
	100000.	0.411	-0.135	*0.134	-0.934E-01		
In II 7S-7P 17576.0 Å C=0.72E+20	5000.	11.8	-4.48	*0.880	-0.352	*0.958	-0.297
	10000.	9.19	-4.07	1.10	-0.518	*1.14	-0.414
	20000.	7.67	-3.43	1.28	-0.657	*1.29	-0.531
	30000.	7.09	-3.09	1.38	-0.746	*1.35	-0.600
	50000.	6.49	-2.75	1.46	-0.828	*1.41	-0.669
	100000.	5.83	-2.28	1.60	-0.958	1.46	-0.761
In II 7S-8P 6898.6 Å C=0.56E+19	5000.	3.25	-1.54				
	10000.	2.67	-1.30	*0.453	-0.206		
	20000.	2.36	-1.16	*0.515	-0.267		
	30000.	2.24	-1.04	*0.543	-0.302		
	50000.	2.13	-0.898	*0.582	-0.340	*0.555	-0.272
	100000.	1.99	-0.727	*0.627	-0.384	*0.542	-0.297
In II 7S-9P 5170.4 Å C=0.16E+19	5000.	*3.52	-1.78				
	10000.	3.04	-1.56				
	20000.	2.78	-1.39				
	30000.	2.72	-1.24				
	50000.	2.66	-1.08				
	100000.	2.50	-0.849	*0.782	-0.550		

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 5P-6S 2027.9 Å C=0.58E+19	5000.	0.225E-01	0.103E-01	0.139E-03	0.263E-03	0.223E-03	0.252E-03
	10000.	0.156E-01	0.766E-02	0.354E-03	0.487E-03	0.462E-03	0.442E-03
	20000.	0.109E-01	0.596E-02	0.658E-03	0.729E-03	0.730E-03	0.633E-03
	30000.	0.893E-02	0.497E-02	0.888E-03	0.888E-03	0.881E-03	0.734E-03
	50000.	0.746E-02	0.425E-02	0.111E-02	0.102E-02	0.104E-02	0.842E-03
100000.	0.614E-02	0.345E-02	0.141E-02	0.123E-02	0.127E-02	0.101E-02	
In II 5P-7S 1301.5 Å C=0.96E+18	5000.	0.238E-01	0.132E-01	0.360E-03	0.696E-03	0.428E-03	0.603E-03
	10000.	0.163E-01	0.107E-01	0.772E-03	0.107E-02	0.760E-03	0.907E-03
	20000.	0.120E-01	0.821E-02	0.129E-02	0.140E-02	0.113E-02	0.115E-02
	30000.	0.110E-01	0.742E-02	0.154E-02	0.160E-02	0.131E-02	0.130E-02
	50000.	0.969E-02	0.634E-02	0.183E-02	0.182E-02	0.156E-02	0.148E-02
100000.	0.830E-02	0.508E-02	0.231E-02	0.210E-02	0.186E-02	0.171E-02	
In II 5P-8S 1130.4 Å C=0.37E+18	5000.	0.399E-01	0.195E-01	0.132E-02	0.172E-02	0.130E-02	0.144E-02
	10000.	0.279E-01	0.184E-01	0.238E-02	0.246E-02	0.204E-02	0.200E-02
	20000.	0.233E-01	0.151E-01	0.316E-02	0.314E-02	0.264E-02	0.255E-02
	30000.	0.210E-01	0.141E-01	0.358E-02	0.357E-02	0.301E-02	0.289E-02
	50000.	0.189E-01	0.123E-01	0.423E-02	0.399E-02	0.354E-02	0.322E-02
100000.	0.170E-01	0.981E-02	0.511E-02	0.460E-02	0.417E-02	0.376E-02	
In II 5P-9S 1057.9 Å C=0.18E+18	5000.	0.656E-01	0.335E-01	*0.392E-02	*0.366E-02	*0.346E-02	*0.275E-02
	10000.	0.487E-01	0.323E-01	*0.554E-02	*0.506E-02	*0.459E-02	*0.399E-02
	20000.	0.422E-01	0.277E-01	*0.698E-02	*0.654E-02	*0.578E-02	*0.530E-02
	30000.	0.398E-01	0.252E-01	*0.792E-02	*0.739E-02	*0.652E-02	*0.599E-02
	50000.	0.364E-01	0.226E-01	*0.918E-02	*0.829E-02	*0.748E-02	*0.662E-02
100000.	0.340E-01	0.184E-01	0.104E-01	0.936E-02	*0.785E-02	*0.733E-02	
In II 6P-7S 7522.4 Å C=0.32E+20	5000.	1.29	0.466	0.390E-01	0.287E-01	0.457E-01	0.242E-01
	10000.	0.951	0.419	0.601E-01	0.433E-01	0.635E-01	0.365E-01
	20000.	0.723	0.362	0.777E-01	0.564E-01	0.754E-01	0.460E-01
	30000.	0.651	0.313	0.863E-01	0.636E-01	0.829E-01	0.521E-01
	50000.	0.571	0.283	0.974E-01	0.723E-01	0.912E-01	0.587E-01
100000.	0.484	0.230	0.114	0.842E-01	0.986E-01	0.670E-01	
In II 6P-8S 4012.3 Å C=0.46E+19	5000.	0.599	0.257	0.215E-01	0.228E-01	*0.224E-01	*0.189E-01
	10000.	0.442	0.250	0.347E-01	0.323E-01	*0.316E-01	*0.261E-01
	20000.	0.364	0.209	0.450E-01	0.412E-01	0.389E-01	0.334E-01
	30000.	0.337	0.188	0.514E-01	0.472E-01	0.443E-01	0.381E-01
	50000.	0.301	0.174	0.596E-01	0.526E-01	0.492E-01	0.417E-01
100000.	0.270	0.140	0.691E-01	0.597E-01	0.589E-01	0.481E-01	
In II 6P-9S 3227.0 Å C=0.17E+19	5000.	0.664	0.317	*0.383E-01	*0.344E-01	*0.338E-01	*0.259E-01
	10000.	0.501	0.310	*0.531E-01	*0.475E-01	*0.446E-01	*0.376E-01
	20000.	0.431	0.266	*0.669E-01	*0.612E-01	*0.567E-01	*0.499E-01
	30000.	0.407	0.245	*0.750E-01	*0.695E-01	*0.632E-01	*0.562E-01
	50000.	0.375	0.222	*0.874E-01	*0.780E-01	*0.724E-01	*0.621E-01
100000.	0.351	0.182	0.101	0.883E-01	*0.753E-01	*0.704E-01	
In II 7P-8S 16834.0 Å C=0.66E+20	5000.	14.8	5.61	*0.926	*0.538	*0.950	*0.436
	10000.	11.9	5.18	*1.18	*0.750	*1.16	*0.600
	20000.	10.1	4.92	1.41	0.962	*1.34	*0.775
	30000.	9.29	4.50	1.54	1.09	*1.43	*0.885
	50000.	8.57	4.00	1.70	1.21	*1.51	*0.975
100000.	7.80	3.40	1.86	1.38	*1.70	*1.13	
In II 7P-9S 8329.9 Å C=0.11E+20	5000.	5.40	2.12	*0.343	*0.249		
	10000.	4.38	2.21	*0.445	*0.348		
	20000.	3.75	2.08	*0.554	*0.450	*0.468	*0.356
	30000.	3.53	1.90	*0.618	*0.510	*0.517	*0.410
	50000.	3.33	1.70	*0.676	*0.560	*0.566	*0.443
100000.	3.10	1.43	0.767	0.642	*0.628	*0.528	
In II 5P-5D 1735.8 Å C=0.18E+19	5000.	0.220E-01	0.191E-02	0.833E-03	0.241E-03	0.116E-02	0.229E-03
	10000.	0.158E-01	0.168E-02	0.134E-02	0.441E-03	0.166E-02	0.392E-03
	20000.	0.117E-01	0.141E-02	0.184E-02	0.649E-03	0.198E-02	0.556E-03
	30000.	0.101E-01	0.142E-02	0.200E-02	0.777E-03	0.213E-02	0.632E-03
	50000.	0.853E-02	0.133E-02	0.221E-02	0.893E-03	0.231E-02	0.726E-03
100000.	0.701E-02	0.119E-02	0.248E-02	0.106E-02	0.247E-02	0.867E-03	

PERTURBERS ARE: TRANSITION		ELECTRONS		PROTONS		IONIZED HELIUM	
	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 5P-6D 1247.1 Å C=0.18E+18	5000.	0.408E-01	-0.153E-02	0.267E-02	-0.134E-02	*0.312E-02	-0.114E-02
	10000.	0.341E-01	-0.231E-02	0.364E-02	-0.203E-02	*0.377E-02	-0.162E-02
	20000.	0.308E-01	-0.168E-02	0.431E-02	-0.255E-02	*0.433E-02	-0.206E-02
	30000.	0.295E-01	-0.180E-02	0.474E-02	-0.288E-02	0.461E-02	-0.235E-02
	50000.	0.281E-01	-0.169E-02	0.521E-02	-0.327E-02	0.494E-02	-0.263E-02
100000.	0.257E-01	-0.134E-02	0.572E-02	-0.376E-02	0.522E-02	-0.300E-02	
In II 5P-7D 1109.4 Å C=0.99E+17	5000.	0.589E-01	-0.327E-02	*0.650E-02	-0.239E-02		
	10000.	0.540E-01	-0.430E-02	*0.774E-02	-0.334E-02		
	20000.	0.531E-01	-0.366E-02	*0.892E-02	-0.425E-02	*0.884E-02	-0.343E-02
	30000.	0.533E-01	-0.344E-02	*0.946E-02	-0.483E-02	*0.917E-02	-0.388E-02
	50000.	0.533E-01	-0.344E-02	*0.100E-01	-0.532E-02	*0.963E-02	-0.438E-02
100000.	0.510E-01	-0.255E-02	0.106E-01	-0.608E-02	*0.994E-02	-0.498E-02	
In II 5P-8D 1046.2 Å C=0.64E+17	5000.	0.889E-01	-0.247E-02				
	10000.	0.887E-01	-0.336E-02				
	20000.	0.937E-01	-0.288E-02	*0.162E-01	-0.207E-02		
	30000.	0.970E-01	-0.279E-02	*0.166E-01	-0.235E-02		
	50000.	0.994E-01	-0.268E-02	*0.170E-01	-0.268E-02		
100000.	0.972E-01	-0.231E-02	*0.174E-01	-0.302E-02	*0.173E-01	-0.242E-02	
In II 5P-9D 1013.2 Å C=0.38E+17	5000.	0.613E-01	-0.173E-01				
	10000.	0.464E-01	-0.149E-01				
	20000.	0.378E-01	-0.122E-01				
	30000.	0.348E-01	-0.118E-01				
	50000.	0.320E-01	-0.105E-01				
100000.	0.296E-01	-0.826E-02					
In II 6P-6D 6007.5 Å C=0.41E+19	5000.	1.18	0.621E-01	0.727E-01	-0.286E-01	*0.838E-01	-0.243E-01
	10000.	0.971	0.262E-01	0.944E-01	-0.433E-01	*0.992E-01	-0.347E-01
	20000.	0.859	0.194E-01	0.110	-0.544E-01	*0.113	-0.444E-01
	30000.	0.814	0.143E-01	0.120	-0.616E-01	*0.120	-0.500E-01
	50000.	0.766	0.840E-02	0.130	-0.703E-01	0.126	-0.562E-01
100000.	0.696	0.603E-02	0.140	-0.801E-01	0.131	-0.650E-01	
In II 6P-7D 3758.7 Å C=0.11E+19	5000.	0.750	-0.802E-02	*0.773E-01	-0.266E-01		
	10000.	0.678	-0.227E-01	*0.919E-01	-0.371E-01		
	20000.	0.658	-0.202E-01	*0.105	-0.476E-01	*0.105	-0.383E-01
	30000.	0.657	-0.196E-01	*0.111	-0.538E-01	*0.108	-0.439E-01
	50000.	0.651	-0.222E-01	*0.117	-0.600E-01	*0.114	-0.480E-01
100000.	0.621	-0.150E-01	0.124	-0.685E-01	*0.118	-0.562E-01	
In II 6P-8D 3120.2 Å C=0.57E+18	5000.	0.833	-0.172E-01				
	10000.	0.824	-0.189E-01				
	20000.	0.863	-0.159E-01				
	30000.	0.890	-0.152E-01	*0.150	-0.196E-01		
	50000.	0.910	-0.145E-01	*0.153	-0.220E-01		
100000.	0.887	-0.123E-01	*0.157	-0.257E-01	*0.155	-0.206E-01	
In II 6P-9D 2844.1 Å C=0.30E+18	5000.	0.518	-0.144				
	10000.	0.394	-0.118				
	20000.	0.323	-0.940E-01				
	30000.	0.297	-0.892E-01				
	50000.	0.273	-0.774E-01				
100000.	0.252	-0.584E-01					
In II 7P-7D 13120.9 Å C=0.14E+20	5000.	11.2	0.919	*1.09	-0.241		
	10000.	9.96	0.641	*1.29	-0.342		
	20000.	9.63	0.639	*1.45	-0.437		
	30000.	9.58	0.571	*1.50	-0.500	*1.52	-0.403
	50000.	9.46	0.434	*1.56	-0.558	*1.55	-0.442
100000.	9.01	0.391	1.67	-0.633	*1.57	-0.513	
In II 7P-8D 7653.3 Å C=0.34E+19	5000.	5.47	0.369				
	10000.	5.38	0.238				
	20000.	5.64	0.202				
	30000.	5.81	0.179	*0.951	-0.303E-01		
	50000.	5.94	0.145	*0.970	-0.346E-01		
100000.	5.79	0.118	*1.01	-0.412E-01			

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 7P-9D 6181.7 Å C=0.14E+19	5000.	2.72	-0.500				
	10000.	2.13	-0.348				
	20000.	1.80	-0.272				
	30000.	1.69	-0.254				
	50000.	1.58	-0.195				
	100000.	1.48	-0.151				
In II 8P-9D 13567.2 Å C=0.69E+19	5000.	16.2	0.494				
	10000.	13.5	0.858				
	20000.	12.1	0.898				
	30000.	11.6	0.853				
	50000.	11.2	0.851				
	100000.	10.6	0.761				
In II 5D-6P 16865.4 Å C=0.17E+21	5000.	4.35	-1.17	0.222	-0.586E-01	0.275	-0.535E-01
	10000.	3.22	-0.911	0.318	-0.959E-01	0.353	-0.832E-01
	20000.	2.46	-0.690	0.379	-0.136	0.403	-0.110
	30000.	2.17	-0.617	0.410	-0.152	0.431	-0.125
	50000.	1.87	-0.530	0.447	-0.175	0.458	-0.142
	100000.	1.58	-0.424	0.482	-0.207	0.476	-0.167
In II 5D-7P 4014.0 Å C=0.38E+19	5000.	0.522	-0.204	*0.471E-01	-0.152E-01	*0.515E-01	-0.130E-01
	10000.	0.398	-0.156	0.579E-01	-0.229E-01	*0.611E-01	-0.182E-01
	20000.	0.331	-0.127	0.666E-01	-0.287E-01	*0.687E-01	-0.233E-01
	30000.	0.305	-0.113	0.714E-01	-0.326E-01	*0.715E-01	-0.265E-01
	50000.	0.279	-0.963E-01	0.754E-01	-0.367E-01	*0.745E-01	-0.291E-01
	100000.	0.251	-0.782E-01	0.822E-01	-0.427E-01	0.773E-01	-0.343E-01
In II 5D-8P 2965.7 Å C=0.10E+19	5000.	0.568	-0.255				
	10000.	0.461	-0.213	*0.843E-01	-0.366E-01		
	20000.	0.405	-0.183	*0.950E-01	-0.472E-01		
	30000.	0.382	-0.164	*0.101	-0.541E-01		
	50000.	0.364	-0.139	*0.106	-0.592E-01	*0.102	-0.473E-01
	100000.	0.339	-0.112	*0.117	-0.691E-01	*0.102	-0.535E-01
In II 5D-9P 2593.1 Å C=0.39E+18	5000.	*0.869	-0.431				
	10000.	0.746	-0.373				
	20000.	0.681	-0.331				
	30000.	0.663	-0.291				
	50000.	0.648	-0.252				
	100000.	0.609	-0.198	*0.199	-0.138		
In II 6D-8P 8974.0 Å C=0.92E+19	5000.	6.08	-2.09				
	10000.	5.14	-1.82	*0.792	-0.291		
	20000.	4.69	-1.50	*0.884	-0.375		
	30000.	4.54	-1.34	*0.933	-0.430		
	50000.	4.38	-1.14	*0.967	-0.475	*0.933	-0.378
	100000.	4.11	-0.917	*1.01	-0.535	*0.988	-0.430
In II 6D-9P 6254.5 Å C=0.23E+19	5000.	*5.43	-2.41				
	10000.	4.75	-2.09				
	20000.	4.41	-1.84				
	30000.	4.33	-1.62				
	50000.	4.26	-1.40				
	100000.	4.02	-1.10	*1.17	-0.783		
In II 5D-5F 3151.5 Å C=0.57E+18	5000.	0.692	0.372				
	10000.	0.607	0.310	*0.964E-01	0.727E-01		
	20000.	0.559	0.249	*0.121	0.956E-01		
	30000.	0.544	0.217	*0.130	0.107		
	50000.	0.528	0.189	*0.149	0.119		
	100000.	0.489	0.147	*0.158	0.137	*0.127	0.105
In II 5D-6F 2678.2 Å C=0.26E+18	5000.	*1.02	0.560				
	10000.	0.896	0.480				
	20000.	0.822	0.408				
	30000.	0.812	0.361				
	50000.	0.795	0.307				
	100000.	0.742	0.238				

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 5D-7F 2456.1 Å C=0.15E+18	5000.	*1.60	*0.892				
	10000.	*1.43	*0.787				
	20000.	*1.38	*0.690				
	30000.	1.37	0.614				
	50000.	1.34	0.521				
	100000.	1.25	0.402				
In II 5D-8F 2678.2 Å C=0.26E+18	5000.	*1.02	*0.562				
	10000.	0.897	0.481				
	20000.	0.822	0.410				
	30000.	0.813	0.363				
	50000.	0.796	0.309				
	100000.	0.743	0.239				
In II 5D-9F 2252.3 Å C=0.68E+17	5000.						
	10000.						
	20000.						
	30000.	*3.37	*1.42				
	50000.	*3.27	*1.21				
	100000.	*3.07	*0.974				
In II 6D-6F 6773.6 Å C=0.17E+19	5000.	*7.24	*3.71				
	10000.	6.40	3.17				
	20000.	5.92	2.72				
	30000.	5.84	2.41				
	50000.	5.71	2.04				
	100000.	5.33	1.59				
In II 6D-7F 5512.6 Å C=0.76E+18	5000.	*8.55	*4.57				
	10000.	*7.65	*4.03				
	20000.	*7.38	*3.54				
	30000.	7.33	3.15				
	50000.	7.15	2.67				
	100000.	6.69	2.07				
In II 6D-8F 4919.5 Å C=0.43E+18	5000.						
	10000.	*10.2	*5.44				
	20000.	*10.1	*4.62				
	30000.	*10.1	*4.34				
	50000.	*9.81	*3.66				
	100000.	9.19	2.89				
In II 6D-9F 4582.3 Å C=0.28E+18	5000.						
	10000.						
	20000.						
	30000.	*14.2	*5.92				
	50000.	*13.8	*5.04				
	100000.	*13.0	*4.06				
In II 5D-4F 4665.5 Å C=0.25E+19	5000.	0.546	0.394E-01	0.321E-01	0.199E-01	*0.375E-01	*0.169E-01
	10000.	0.432	0.447E-01	0.460E-01	0.300E-01	*0.466E-01	*0.238E-01
	20000.	0.357	0.437E-01	0.555E-01	0.377E-01	0.544E-01	0.306E-01
	30000.	0.322	0.417E-01	0.612E-01	0.425E-01	0.585E-01	0.345E-01
	50000.	0.283	0.397E-01	0.688E-01	0.481E-01	0.625E-01	0.384E-01
	100000.	0.240	0.350E-01	0.787E-01	0.563E-01	0.707E-01	0.452E-01
In II 4F-7D 9009.2 Å C=0.65E+19	5000.	5.01	-0.609	*0.478	-0.199		
	10000.	4.53	-0.555	*0.578	-0.274		
	20000.	4.35	-0.486	*0.665	-0.353		
	30000.	4.30	-0.438	*0.701	-0.398	*0.670	-0.317
	50000.	4.22	-0.417	*0.751	-0.444	*0.707	-0.353
	100000.	3.97	-0.333	0.821	-0.495	*0.743	-0.407
In II 4F-8D 6044.3 Å C=0.21E+19	5000.	3.49	-0.362				
	10000.	3.41	-0.307				
	20000.	3.51	-0.251				
	30000.	3.59	-0.219	*0.572	-0.123		
	50000.	3.63	-0.192	*0.589	-0.137		
	100000.	3.51	-0.161	*0.618	-0.156	*0.599	-0.125

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
In II 4F-9D 5087.8 Å C=0.97E+18	5000.	1.90	-0.639				
	10000.	1.47	-0.525				
	20000.	1.22	-0.429				
	30000.	1.12	-0.396				
	50000.	1.03	-0.343				
	100000.	0.934	-0.269				
In II 5F-6D 10922.3 Å C=0.68E+19	5000.	10.3	-4.88				
	10000.	9.12	-4.08	*1.24	-0.917		
	20000.	8.43	-3.28	*1.51	-1.19		
	30000.	8.21	-2.85	*1.66	-1.37		
	50000.	7.99	-2.48	*1.86	-1.48		
	100000.	7.42	-1.93	*2.07	-1.76	*1.57	-1.35

corresponding full width at half maximum. For each value given in Table 1, the collision volume (V) multiplied by the perturber density (N) is much less than one and the impact approximation is valid (Sahal-Bréchet, 1969ab). Values for $NV > 0.5$ are not given and values for $0.1 < NV \leq 0.5$ are denoted by an asterisk. When the impact approximation is not valid, the ion broadening contribution may be estimated by using quasistatic approach (Sahal-Bréchet 1991 or Griem 1974). In the region between where neither of these two approximations is valid, a unified type theory should be used. For example in Barnard *et al.* (1974), a simple analytical formula for such a case is given. The accuracy of the results obtained decreases when broadening by ion interactions becomes important.

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ТАБЕЛЕ ПАРАМЕТАРА ШТАРКОВОГ ШИРЕЊА СПЕКТРАЛНИХ ЛИНИЈА In II
(Део II)

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Претходно саопштење

Користећи семикласичан прилаз, израчунате су ширине и помераји спектралних линија, проузроковани сударима са електронима, протонима и јонима хелијума, за 101 мулти-

плет In II. Резултати су дати за температуре 5000 К, 10000 К, 20000 К, 30000 К, 50000 К и 100000 К и концентрацију пертурбера 10^{16} cm^{-3} .