

STARK BROADENING PARAMETER TABLES FOR Al I LINES OF ASTROPHYSICAL INTEREST

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SUMMARY: Using a semiclassical approach, we have calculated electron-, proton-, and ionized helium-impact line widths and shifts for 25 Al I multiplets as a function of temperature for perturber densities 10^{13} – 10^{14} cm⁻³ and 10^{16} – 10^{18} cm⁻³.

1. INTRODUCTION

Astrophysical importance of neutral aluminum lines is due to its cosmical abundance and presence in solar (e. g. Goldberg, Muller, Aller, 1960) and stellar (e. g. Meril, 1956) spectra. Moreover, Al I lines are very important for spectral analysis of laboratory plasma as well. In order to provide reliable data for Al I lines broadened by collisions with charged perturbers in stellar and laboratory plasmas, we have calculated electron-, proton-, and ionized helium-impact line widths and shifts for 25 Al I multiplets, using the semiclassical-perturbation formalism (Sahal-Bréchet, 1969 a b). The obtained results for perturber density of 10^{15} cm⁻³, together with discussion, analysis and comparison with existing theoretical data will be published in the principal article elsewhere (Dimitrijević, and Sahal-Bréchet, 1992).

Since data are not linear with perturber density (N), due to the Debye screening effect, we will present here the data for $N = 10^{13}$ – 10^{14} cm⁻³ of interest for stellar atmospheres and data for $N = 10^{16}$ – 10^{19} cm⁻³, of principal interest for subphotospheric plasma research and laboratory plasma.

2. RESULTS AND DISCUSSION

All details of the calculation procedure has been described in Dimitrijević and Sahal-Bréchet (1984) and will not be repeated here. Energy levels for Al I lines have been taken from Bashkin and Stoner (1975). Oscillator strengths have been calculated using the method of Bates and Damgaard (1949) and tables of Oertel and Shomo (1968). For the transitions including higher atomic energy levels, the method described by Van Regemorter et al.

Table 1. This table gives electron-, proton-, and ionized-helium- impact broadening parameters for Al I lines, for perturber densities $10^{13} - 10^{14} \text{ cm}^{-3}$; $10^{16} - 10^{19} \text{ cm}^{-3}$ and temperatures from 3,000 K to 50,000 K. Transitions and averaged wavelengths for the multiplet (in Å) are also given. By dividing C by the electron-impact full halfwidth, 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.

PERTURBER DENSITY= 0.1D+14(cm-3)							
PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
3D - 4P 193106.1 A C= 0.19E+19	3000.	0.364	-0.169	0.694E-01	-0.600E-01	0.584E-01	-0.484E-01
	5000.	0.382	-0.131	0.746E-01	-0.655E-01	0.624E-01	-0.529E-01
	10000.	0.407	-0.862E-01	0.826E-01	-0.736E-01	0.686E-01	-0.595E-01
	20000.	0.404	-0.547E-01	0.917E-01	-0.827E-01	0.758E-01	-0.668E-01
	30000.	0.401	-0.363E-01	0.977E-01	-0.884E-01	0.804E-01	-0.715E-01
	50000.	0.400	-0.224E-01	0.106	-0.963E-01	0.868E-01	-0.778E-01
3D - 5P 12759.1 A C= 0.84E+16	3000.	0.188E-02	0.640E-03	0.615E-03	0.155E-03	0.611E-03	0.125E-03
	5000.	0.217E-02	0.774E-03	0.617E-03	0.169E-03	0.612E-03	0.136E-03
	10000.	0.259E-02	0.854E-03	0.620E-03	0.190E-03	0.614E-03	0.153E-03
	20000.	0.307E-02	0.863E-03	0.626E-03	0.213E-03	0.617E-03	0.172E-03
	30000.	0.337E-02	0.764E-03	0.629E-03	0.228E-03	0.619E-03	0.184E-03
	50000.	0.375E-02	0.654E-03	0.635E-03	0.248E-03	0.623E-03	0.201E-03
3D - 6P 9174.6 A C= 0.44E+16	3000.	0.294E-02	0.179E-02	0.967E-03	0.467E-03	0.932E-03	0.377E-03
	5000.	0.331E-02	0.203E-02	0.987E-03	0.510E-03	0.944E-03	0.412E-03
	10000.	0.388E-02	0.194E-02	0.102E-02	0.574E-03	0.965E-03	0.464E-03
	20000.	0.458E-02	0.176E-02	0.106E-02	0.646E-03	0.992E-03	0.521E-03
	30000.	0.507E-02	0.153E-02	0.109E-02	0.691E-03	0.101E-02	0.558E-03
	50000.	0.564E-02	0.128E-02	0.113E-02	0.753E-03	0.104E-02	0.608E-03
3D - 7P 8004.5 A C= 0.27E+16	3000.	0.610E-02	0.424E-02	0.181E-02	0.107E-02	0.169E-02	0.863E-03
	5000.	0.670E-02	0.446E-02	0.187E-02	0.118E-02	0.173E-02	0.947E-03
	10000.	0.764E-02	0.439E-02	0.197E-02	0.133E-02	0.180E-02	0.107E-02
	20000.	0.882E-02	0.342E-02	0.209E-02	0.149E-02	0.188E-02	0.120E-02
	30000.	0.967E-02	0.280E-02	0.218E-02	0.160E-02	0.194E-02	0.129E-02
	50000.	0.105E-01	0.224E-02	0.229E-02	0.174E-02	0.203E-02	0.141E-02
4S - 4P 13147.3 A C= 0.90E+16	3000.	0.113E-02	-0.502E-03	0.268E-03	-0.205E-03	0.236E-03	-0.165E-03
	5000.	0.118E-02	-0.389E-03	0.284E-03	-0.223E-03	0.248E-03	-0.180E-03
	10000.	0.127E-02	-0.299E-03	0.308E-03	-0.251E-03	0.266E-03	-0.203E-03
	20000.	0.134E-02	-0.225E-03	0.337E-03	-0.281E-03	0.287E-03	-0.228E-03
	30000.	0.140E-02	-0.175E-03	0.356E-03	-0.301E-03	0.301E-03	-0.243E-03
	50000.	0.149E-02	-0.131E-03	0.383E-03	-0.328E-03	0.321E-03	-0.265E-03
4S - 5P 6699.8 A C= 0.78E+16	3000.	0.435E-03	0.241E-03	0.185E-03	0.636E-04	0.182E-03	0.513E-04
	5000.	0.490E-03	0.276E-03	0.186E-03	0.693E-04	0.183E-03	0.560E-04
	10000.	0.587E-03	0.268E-03	0.189E-03	0.779E-04	0.185E-03	0.629E-04
	20000.	0.724E-03	0.249E-03	0.193E-03	0.875E-04	0.187E-03	0.707E-04
	30000.	0.820E-03	0.214E-03	0.195E-03	0.936E-04	0.188E-03	0.756E-04
	50000.	0.947E-03	0.179E-03	0.199E-03	0.102E-03	0.191E-03	0.824E-04

STARK BROADENING PARAMETER TABLES FOR AI I LINES OF ASTROPHYSICAL INTEREST

PERTURBER DENSITY= 0.1D+14(cm ⁻³)							
PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
4S - 6P	3000.	0.103E-02	0.693E-03	0.365E-03	0.178E-03	0.352E-03	0.144E-03
5559.3 A	5000.	0.115E-02	0.760E-03	0.373E-03	0.194E-03	0.356E-03	0.157E-03
C= 0.26E+16	10000.	0.134E-02	0.763E-03	0.386E-03	0.219E-03	0.364E-03	0.177E-03
	20000.	0.160E-02	0.647E-03	0.402E-03	0.246E-03	0.375E-03	0.199E-03
	30000.	0.179E-02	0.572E-03	0.413E-03	0.263E-03	0.382E-03	0.213E-03
	50000.	0.201E-02	0.468E-03	0.430E-03	0.287E-03	0.393E-03	0.232E-03
4S - 7P	3000.	0.243E-02	0.170E-02	0.742E-03	0.440E-03	0.694E-03	0.354E-03
5106.9 A	5000.	0.267E-02	0.188E-02	0.768E-03	0.482E-03	0.711E-03	0.388E-03
C= 0.11E+16	10000.	0.304E-02	0.174E-02	0.809E-03	0.543E-03	0.739E-03	0.439E-03
	20000.	0.353E-02	0.141E-02	0.860E-03	0.612E-03	0.774E-03	0.494E-03
	30000.	0.388E-02	0.114E-02	0.893E-03	0.655E-03	0.798E-03	0.529E-03
	50000.	0.424E-02	0.889E-03	0.941E-03	0.714E-03	0.832E-03	0.577E-03
4P - 5S	3000.	0.542E-02	0.319E-02	0.101E-02	0.876E-03	0.853E-03	0.707E-03
21117.0 A	5000.	0.572E-02	0.331E-02	0.109E-02	0.956E-03	0.913E-03	0.772E-03
C= 0.23E+17	10000.	0.600E-02	0.336E-02	0.121E-02	0.107E-02	0.100E-02	0.868E-03
	20000.	0.640E-02	0.310E-02	0.134E-02	0.121E-02	0.111E-02	0.976E-03
	30000.	0.667E-02	0.267E-02	0.143E-02	0.129E-02	0.118E-02	0.104E-02
	50000.	0.729E-02	0.219E-02	0.154E-02	0.141E-02	0.127E-02	0.114E-02
4P - 4D	3000.	0.384E-02	0.225E-02	0.767E-03	0.618E-03	0.664E-03	0.499E-03
17929.8 A	5000.	0.405E-02	0.241E-02	0.817E-03	0.674E-03	0.702E-03	0.544E-03
C= 0.17E+17	10000.	0.425E-02	0.223E-02	0.895E-03	0.758E-03	0.761E-03	0.612E-03
	20000.	0.451E-02	0.198E-02	0.984E-03	0.851E-03	0.829E-03	0.688E-03
	30000.	0.474E-02	0.170E-02	0.104E-02	0.911E-03	0.874E-03	0.736E-03
	50000.	0.513E-02	0.138E-02	0.112E-02	0.992E-03	0.936E-03	0.802E-03
4P - 5D	3000.	0.236E-02	0.112E-02	0.598E-03	0.299E-03	0.574E-03	0.241E-03
10774.2 A	5000.	0.264E-02	0.126E-02	0.611E-03	0.326E-03	0.582E-03	0.263E-03
C= 0.60E+16	10000.	0.304E-02	0.119E-02	0.633E-03	0.367E-03	0.596E-03	0.296E-03
	20000.	0.354E-02	0.110E-02	0.661E-03	0.412E-03	0.614E-03	0.333E-03
	30000.	0.388E-02	0.962E-03	0.680E-03	0.441E-03	0.627E-03	0.356E-03
	50000.	0.432E-02	0.802E-03	0.708E-03	0.480E-03	0.646E-03	0.388E-03
4D - 5P	3000.	0.256E-01	0.431E-02	0.108E-01	0.149E-02	0.108E-01	0.120E-02
57393.7 A	5000.	0.315E-01	0.346E-02	0.108E-01	0.162E-02	0.108E-01	0.131E-02
C= 0.57E+18	10000.	0.443E-01	0.240E-02	0.108E-01	0.182E-02	0.108E-01	0.147E-02
	20000.	0.618E-01	0.207E-02	0.109E-01	0.205E-02	0.108E-01	0.165E-02
	30000.	0.729E-01	0.177E-02	0.109E-01	0.219E-02	0.108E-01	0.177E-02
	50000.	0.862E-01	0.148E-02	0.109E-01	0.238E-02	0.109E-01	0.193E-02
4D - 6P	3000.	0.140E-01	0.934E-02	0.471E-02	0.233E-02	0.452E-02	0.188E-02
20813.7 A	5000.	0.157E-01	0.926E-02	0.481E-02	0.254E-02	0.459E-02	0.205E-02
C= 0.36E+17	10000.	0.190E-01	0.925E-02	0.498E-02	0.286E-02	0.469E-02	0.231E-02
	20000.	0.234E-01	0.761E-02	0.520E-02	0.322E-02	0.483E-02	0.260E-02
	30000.	0.267E-01	0.634E-02	0.535E-02	0.344E-02	0.493E-02	0.278E-02
	50000.	0.304E-01	0.591E-02	0.556E-02	0.375E-02	0.508E-02	0.303E-02

PERTURBER DENSITY= 0.1D+14(cm-3)							
TRANSITION	PERTURBERS ARE T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
4D - 7P 15630.4 A C= 0.10E+17	3000.	0.227E-01	0.155E-01	0.674E-02	0.407E-02	0.628E-02	0.327E-02
	5000.	0.249E-01	0.166E-01	0.699E-02	0.446E-02	0.645E-02	0.359E-02
	10000.	0.287E-01	0.158E-01	0.738E-02	0.502E-02	0.671E-02	0.406E-02
	20000.	0.337E-01	0.120E-01	0.785E-02	0.566E-02	0.704E-02	0.456E-02
	30000.	0.373E-01	0.949E-02	0.817E-02	0.606E-02	0.727E-02	0.489E-02
	50000.	0.410E-01	0.773E-02	0.862E-02	0.660E-02	0.759E-02	0.533E-02
5S - 5P 38697.4 A C= 0.26E+18	3000.	0.126E-01	0.858E-03	0.598E-02	0.533E-03	0.598E-02	0.431E-03
	5000.	0.152E-01	0.162E-03	0.598E-02	0.581E-03	0.598E-02	0.470E-03
	10000.	0.211E-01	-0.275E-03	0.598E-02	0.652E-03	0.598E-02	0.527E-03
	20000.	0.294E-01	-0.659E-03	0.598E-02	0.732E-03	0.598E-02	0.592E-03
	30000.	0.347E-01	-0.536E-03	0.598E-02	0.783E-03	0.598E-02	0.633E-03
	50000.	0.412E-01	-0.427E-03	0.599E-02	0.853E-03	0.598E-02	0.689E-03
5S - 6P 17710.6 A C= 0.26E+17	3000.	0.102E-01	0.671E-02	0.365E-02	0.168E-02	0.353E-02	0.135E-02
	5000.	0.114E-01	0.661E-02	0.372E-02	0.183E-02	0.357E-02	0.148E-02
	10000.	0.139E-01	0.651E-02	0.383E-02	0.206E-02	0.364E-02	0.166E-02
	20000.	0.172E-01	0.514E-02	0.397E-02	0.232E-02	0.373E-02	0.187E-02
	30000.	0.197E-01	0.441E-02	0.407E-02	0.248E-02	0.380E-02	0.200E-02
	50000.	0.224E-01	0.389E-02	0.421E-02	0.270E-02	0.389E-02	0.218E-02
5S - 7P 13813.0 A C= 0.79E+16	3000.	0.178E-01	0.121E-01	0.540E-02	0.317E-02	0.506E-02	0.255E-02
	5000.	0.195E-01	0.129E-01	0.559E-02	0.348E-02	0.518E-02	0.280E-02
	10000.	0.225E-01	0.125E-01	0.588E-02	0.392E-02	0.538E-02	0.316E-02
	20000.	0.265E-01	0.930E-02	0.624E-02	0.441E-02	0.563E-02	0.356E-02
	30000.	0.293E-01	0.737E-02	0.648E-02	0.473E-02	0.580E-02	0.382E-02
	50000.	0.323E-01	0.593E-02	0.683E-02	0.515E-02	0.604E-02	0.416E-02
5P - 5D 50974.9 A C= 0.24E+18	3000.	0.375E-01	0.114E-01	0.113E-01	0.289E-02	0.112E-01	0.233E-02
	5000.	0.457E-01	0.120E-01	0.113E-01	0.315E-02	0.112E-01	0.255E-02
	10000.	0.623E-01	0.102E-01	0.114E-01	0.354E-02	0.113E-01	0.286E-02
	20000.	0.853E-01	0.827E-02	0.115E-01	0.398E-02	0.113E-01	0.322E-02
	30000.	0.999E-01	0.785E-02	0.116E-01	0.426E-02	0.114E-01	0.344E-02
	50000.	0.117	0.667E-02	0.117E-01	0.464E-02	0.114E-01	0.375E-02
5D - 6P 90873.6 A C= 0.69E+18	3000.	0.282	0.160	0.805E-01	0.409E-01	0.771E-01	0.330E-01
	5000.	0.325	0.162	0.823E-01	0.446E-01	0.782E-01	0.360E-01
	10000.	0.412	0.146	0.854E-01	0.502E-01	0.802E-01	0.405E-01
	20000.	0.538	0.116	0.893E-01	0.564E-01	0.828E-01	0.456E-01
	30000.	0.621	0.102	0.920E-01	0.604E-01	0.846E-01	0.488E-01
	50000.	0.712	0.867E-01	0.959E-01	0.658E-01	0.872E-01	0.532E-01
5D - 7P 37123.9 A C= 0.57E+17	3000.	0.132	0.862E-01	0.361E-01	0.226E-01	0.334E-01	0.182E-01
	5000.	0.145	0.900E-01	0.376E-01	0.248E-01	0.344E-01	0.200E-01
	10000.	0.171	0.867E-01	0.398E-01	0.279E-01	0.360E-01	0.226E-01
	20000.	0.204	0.643E-01	0.425E-01	0.315E-01	0.379E-01	0.254E-01
	30000.	0.228	0.534E-01	0.444E-01	0.337E-01	0.392E-01	0.272E-01
	50000.	0.253	0.400E-01	0.469E-01	0.367E-01	0.411E-01	0.297E-01

STARK BROADENING PARAMETER TABLES FOR AI I LINES OF ASTROPHYSICAL INTEREST

PERTURBER DENSITY= 0.1D+15(cm-3)							
PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
3P - 4S	3000.	0.210E-03	0.173E-03	0.526E-04	0.486E-04	0.428E-04	0.393E-04
3958.3 A	5000.	0.239E-03	0.194E-03	0.571E-04	0.531E-04	0.465E-04	0.428E-04
C= 0.12E+18	10000.	0.279E-03	0.232E-03	0.639E-04	0.597E-04	0.519E-04	0.482E-04
	20000.	0.310E-03	0.263E-03	0.716E-04	0.671E-04	0.581E-04	0.542E-04
	30000.	0.317E-03	0.251E-03	0.765E-04	0.718E-04	0.621E-04	0.580E-04
	50000.	0.341E-03	0.248E-03	0.832E-04	0.782E-04	0.675E-04	0.632E-04
3P - 5S	3000.	0.472E-03	0.352E-03	0.104E-03	0.964E-04	0.838E-04	0.776E-04
2659.2 A	5000.	0.528E-03	0.402E-03	0.113E-03	0.106E-03	0.912E-04	0.851E-04
C= 0.18E+17	10000.	0.584E-03	0.472E-03	0.127E-03	0.119E-03	0.102E-03	0.960E-04
	20000.	0.620E-03	0.457E-03	0.142E-03	0.134E-03	0.115E-03	0.108E-03
	30000.	0.650E-03	0.450E-03	0.152E-03	0.143E-03	0.123E-03	0.116E-03
	50000.	0.686E-03	0.388E-03	0.166E-03	0.156E-03	0.134E-03	0.126E-03
3P - 3D	3000.	0.392E-03	0.264E-03	0.102E-03	0.887E-04	0.852E-04	0.713E-04
3091.0 A	5000.	0.417E-03	0.243E-03	0.110E-03	0.969E-04	0.913E-04	0.782E-04
C= 0.49E+16	10000.	0.432E-03	0.216E-03	0.122E-03	0.109E-03	0.101E-03	0.880E-04
	20000.	0.420E-03	0.180E-03	0.136E-03	0.123E-03	0.111E-03	0.991E-04
	30000.	0.407E-03	0.160E-03	0.145E-03	0.131E-03	0.118E-03	0.106E-03
	50000.	0.390E-03	0.128E-03	0.157E-03	0.143E-03	0.128E-03	0.116E-03
3P - 4D	3000.	0.448E-03	0.328E-03	0.141E-03	0.888E-04	0.130E-03	0.714E-04
2601.0 A	5000.	0.500E-03	0.380E-03	0.146E-03	0.973E-04	0.134E-03	0.783E-04
C= 0.12E+17	10000.	0.558E-03	0.420E-03	0.155E-03	0.110E-03	0.140E-03	0.883E-04
	20000.	0.611E-03	0.416E-03	0.166E-03	0.123E-03	0.148E-03	0.995E-04
	30000.	0.642E-03	0.386E-03	0.173E-03	0.132E-03	0.153E-03	0.107E-03
	50000.	0.693E-03	0.327E-03	0.183E-03	0.144E-03	0.160E-03	0.116E-03
3P - 5D	3000.	0.853E-03	0.442E-03	0.303E-03	0.115E-03	0.297E-03	0.928E-04
2372.4 A	5000.	0.980E-03	0.492E-03	0.306E-03	0.127E-03	0.299E-03	0.102E-03
C= 0.52E+16	10000.	0.118E-02	0.540E-03	0.312E-03	0.143E-03	0.302E-03	0.115E-03
	20000.	0.142E-02	0.526E-03	0.320E-03	0.161E-03	0.307E-03	0.130E-03
	30000.	0.158E-02	0.485E-03	0.326E-03	0.172E-03	0.311E-03	0.139E-03
	50000.	0.177E-02	0.412E-03	0.334E-03	0.188E-03	0.316E-03	0.152E-03
3D - 4P	3000.	3.64	-1.69	0.694	-0.593	0.584	-0.477
193106.1 A	5000.	3.82	-1.31	0.746	-0.650	0.624	-0.523
C= 0.19E+20	10000.	4.07	-0.862	0.826	-0.732	0.686	-0.591
	20000.	4.04	-0.547	0.917	-0.824	0.758	-0.665
	30000.	4.01	-0.363	0.977	-0.883	0.804	-0.713
	50000.	4.00	-0.224	1.06	-0.962	0.868	-0.777
3D - 5P	3000.	0.188E-01	0.639E-02	0.614E-02	0.154E-02	0.611E-02	0.124E-02
12759.1 A	5000.	0.217E-01	0.773E-02	0.617E-02	0.168E-02	0.612E-02	0.136E-02
C= 0.84E+17	10000.	0.259E-01	0.854E-02	0.620E-02	0.189E-02	0.614E-02	0.153E-02
	20000.	0.307E-01	0.863E-02	0.626E-02	0.213E-02	0.617E-02	0.172E-02
	30000.	0.337E-01	0.764E-02	0.629E-02	0.228E-02	0.619E-02	0.184E-02
	50000.	0.375E-01	0.654E-02	0.635E-02	0.248E-02	0.623E-02	0.201E-02

M. S. DIMITRIJEVIĆ, S. SAHAL-BRÉCHOT

PERTURBER DENSITY= 0.1D+15(cm ⁻³)							
PERTURBERS ARE	ELECTRONS	PROTONS		IONIZED HELIUM			
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
3D - 6P 9174.6 A C= 0.44E+17	3000.	0.294E-01	0.179E-01	0.967E-02	0.456E-02	0.930E-02	0.365E-02
	5000.	0.331E-01	0.203E-01	0.987E-02	0.501E-02	0.943E-02	0.403E-02
	10000.	0.388E-01	0.194E-01	0.102E-01	0.569E-02	0.965E-02	0.458E-02
	20000.	0.458E-01	0.176E-01	0.106E-01	0.641E-02	0.992E-02	0.518E-02
	30000.	0.507E-01	0.153E-01	0.109E-01	0.688E-02	0.101E-01	0.555E-02
	50000.	0.564E-01	0.128E-01	0.113E-01	0.751E-02	0.104E-01	0.606E-02
3D - 7P 8004.5 A C= 0.27E+17	3000.	0.610E-01	0.421E-01	0.180E-01	0.103E-01	*0.168E-01	80.818E-02
	5000.	0.670E-01	0.445E-01	0.187E-01	0.114E-01	0.173E-01	0.911E-02
	10000.	0.764E-01	0.439E-01	0.197E-01	0.130E-01	0.180E-01	0.104E-01
	20000.	0.882E-01	0.342E-01	0.209E-01	0.148E-01	0.188E-01	0.119E-01
	30000.	0.967E-01	0.280E-01	0.218E-01	0.159E-01	0.194E-01	0.128E-01
	50000.	0.105	0.224E-01	0.229E-01	0.173E-01	0.203E-01	0.140E-01
4S - 4P 13147.3 A C= 0.90E+17	3000.	0.113E-01	-0.502E-02	0.268E-02	-0.203E-02	0.236E-02	-0.163E-02
	5000.	0.118E-01	-0.389E-02	0.284E-02	-0.222E-02	0.248E-02	-0.179E-02
	10000.	0.127E-01	-0.299E-02	0.308E-02	-0.250E-02	0.266E-02	-0.201E-02
	20000.	0.134E-01	-0.225E-02	0.337E-02	-0.281E-02	0.287E-02	-0.227E-02
	30000.	0.140E-01	-0.175E-02	0.356E-02	-0.301E-02	0.301E-02	-0.243E-02
	50000.	0.149E-01	-0.131E-02	0.383E-02	-0.328E-02	0.321E-02	-0.265E-02
4S - 5P 6699.8 A C= 0.78E+17	3000.	0.435E-02	0.241E-02	0.185E-02	0.628E-03	0.182E-02	0.505E-03
	5000.	0.490E-02	0.276E-02	0.186E-02	0.688E-03	0.183E-02	0.554E-03
	10000.	0.587E-02	0.268E-02	0.189E-02	0.775E-03	0.185E-02	0.625E-03
	20000.	0.724E-02	0.249E-02	0.193E-02	0.872E-03	0.187E-02	0.704E-03
	30000.	0.820E-02	0.214E-02	0.195E-02	0.934E-03	0.188E-02	0.755E-03
	50000.	0.947E-02	0.179E-02	0.199E-02	0.102E-02	0.191E-02	0.823E-03
4S - 6P 5559.3 A C= 0.26E+17	3000.	0.103E-01	0.691E-02	0.365E-02	0.174E-02	0.351E-02	0.139E-02
	5000.	0.115E-01	0.759E-02	0.373E-02	0.191E-02	0.356E-02	0.153E-02
	10000.	0.134E-01	0.763E-02	0.386E-02	0.217E-02	0.364E-02	0.174E-02
	20000.	0.160E-01	0.647E-02	0.402E-02	0.245E-02	0.375E-02	0.197E-02
	30000.	0.179E-01	0.572E-02	0.413E-02	0.262E-02	0.382E-02	0.211E-02
	50000.	0.201E-01	0.468E-02	0.430E-02	0.286E-02	0.393E-02	0.231E-02
4S - 7P 5106.9 A C= 0.11E+17	3000.	0.243E-01	0.168E-01	0.741E-02	0.421E-02	*0.692E-02	*0.335E-02
	5000.	0.267E-01	0.187E-01	0.767E-02	0.467E-02	0.710E-02	0.374E-02
	10000.	0.304E-01	0.174E-01	0.809E-02	0.533E-02	0.739E-02	0.428E-02
	20000.	0.353E-01	0.140E-01	0.860E-02	0.605E-02	0.774E-02	0.487E-02
	30000.	0.388E-01	0.114E-01	0.893E-02	0.651E-02	0.798E-02	0.524E-02
	50000.	0.424E-01	0.889E-02	0.941E-02	0.710E-02	0.832E-02	0.573E-02
4P - 5S 21117.0 A C= 0.23E+18	3000.	0.542E-01	0.319E-01	0.101E-01	0.864E-02	0.853E-02	0.695E-02
	5000.	0.572E-01	0.331E-01	0.109E-01	0.948E-02	0.913E-02	0.763E-02
	10000.	0.600E-01	0.336E-01	0.121E-01	0.107E-01	0.100E-01	0.862E-02
	20000.	0.640E-01	0.310E-01	0.134E-01	0.120E-01	0.111E-01	0.971E-02
	30000.	0.667E-01	0.267E-01	0.143E-01	0.129E-01	0.118E-01	0.104E-01
	50000.	0.729E-01	0.219E-01	0.154E-01	0.141E-01	0.127E-01	0.113E-01

STARK BROADENING PARAMETER TABLES FOR AI I LINES OF ASTROPHYSICAL INTEREST

PERTURBER DENSITY= 0.1D+15(cm-3)							
PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
4P - 4D 17929.8 A C= 0.17E+18	3000.	0.384E-01	0.224E-01	0.767E-02	0.609E-02	0.664E-02	0.490E-02
	5000.	0.405E-01	0.241E-01	0.818E-02	0.668E-02	0.702E-02	0.538E-02
	10000.	0.425E-01	0.223E-01	0.895E-02	0.753E-02	0.761E-02	0.608E-02
	20000.	0.451E-01	0.198E-01	0.984E-02	0.848E-02	0.829E-02	0.685E-02
	30000.	0.474E-01	0.170E-01	0.104E-01	0.909E-02	0.874E-02	0.734E-02
	50000.	0.513E-01	0.138E-01	0.112E-01	0.991E-02	0.936E-02	0.800E-02
4P - 5D 10774.2 A C= 0.60E+17	3000.	0.236E-01	0.112E-01	0.597E-02	0.294E-02	0.573E-02	0.236E-02
	5000.	0.264E-01	0.125E-01	0.611E-02	0.323E-02	0.582E-02	0.260E-02
	10000.	0.304E-01	0.119E-01	0.633E-02	0.365E-02	0.596E-02	0.294E-02
	20000.	0.354E-01	0.110E-01	0.661E-02	0.410E-02	0.614E-02	0.331E-02
	30000.	0.388E-01	0.962E-02	0.680E-02	0.440E-02	0.627E-02	0.355E-02
	50000.	0.432E-01	0.802E-02	0.708E-02	0.480E-02	0.646E-02	0.387E-02
4D - 5P 57393.7 A C= 0.57E+19	3000.	0.256	0.431E-01	0.108	0.148E-01	0.108	0.120E-01
	5000.	0.315	0.346E-01	0.108	0.162E-01	0.108	0.130E-01
	10000.	0.443	0.240E-01	0.108	0.182E-01	0.108	0.147E-01
	20000.	0.618	0.207E-01	0.109	0.204E-01	0.108	0.165E-01
	30000.	0.729	0.177E-01	0.109	0.219E-01	0.108	0.177E-01
	50000.	0.862	0.148E-01	0.109	0.238E-01	0.109	0.193E-01
4D - 6P 20813.7 A C= 0.36E+18	3000.	0.140	0.932E-01	0.470E-01	0.227E-01	0.452E-01	0.182E-01
	5000.	0.157	0.924E-01	0.481E-01	0.250E-01	0.458E-01	0.201E-01
	10000.	0.190	0.925E-01	0.498E-01	0.283E-01	0.469E-01	0.228E-01
	20000.	0.234	0.761E-01	0.520E-01	0.320E-01	0.483E-01	0.258E-01
	30000.	0.267	0.634E-01	0.535E-01	0.343E-01	0.493E-01	0.277E-01
	50000.	0.304	0.591E-01	0.556E-01	0.374E-01	0.508E-01	0.302E-01
4D - 7P 15630.4 A C= 0.10E+18	3000.	0.227	0.154	0.673E-01	0.390E-01	*0.627E-01	*0.310E-01
	5000.	0.249	0.166	0.698E-01	0.432E-01	0.644E-01	0.346E-01
	10000.	0.287	0.158	0.737E-01	0.493E-01	0.671E-01	0.396E-01
	20000.	0.337	0.120	0.785E-01	0.559E-01	0.704E-01	0.450E-01
	30000.	0.373	0.949E-01	0.817E-01	0.602E-01	0.727E-01	0.484E-01
	50000.	0.410	0.773E-01	0.862E-01	0.656E-01	0.759E-01	0.530E-01
5S - 5P 38697.4 A C= 0.26E+19	3000.	0.126	0.857E-02	0.597E-01	0.530E-02	0.597E-01	0.428E-02
	5000.	0.152	0.162E-02	0.598E-01	0.579E-02	0.597E-01	0.467E-02
	10000.	0.211	-0.275E-02	0.598E-01	0.651E-02	0.598E-01	0.526E-02
	20000.	0.294	-0.659E-02	0.598E-01	0.732E-02	0.598E-01	0.591E-02
	30000.	0.347	-0.536E-02	0.598E-01	0.783E-02	0.598E-01	0.633E-02
	50000.	0.412	-0.427E-02	0.599E-01	0.853E-02	0.598E-01	0.689E-02
5S - 6P 17710.6 A C= 0.26E+18	3000.	0.102	0.670E-01	0.365E-01	0.164E-01	0.353E-01	0.131E-01
	5000.	0.114	0.659E-01	0.372E-01	0.180E-01	0.357E-01	0.145E-01
	10000.	0.139	0.650E-01	0.383E-01	0.204E-01	0.364E-01	0.164E-01
	20000.	0.172	0.514E-01	0.397E-01	0.230E-01	0.373E-01	0.186E-01
	30000.	0.197	0.441E-01	0.407E-01	0.247E-01	0.380E-01	0.199E-01
	50000.	0.224	0.389E-01	0.421E-01	0.269E-01	0.389E-01	0.217E-01

PERTURBER DENSITY= 0.1D+15(cm-3)							
TRANSITION	PERTURBERS ARE T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
5S - 7P 13813.0 A C= 0.79E+17	3000.	0.178	0.120	0.539E-01	0.304E-01	*0.504E-01	*0.242E-01
	5000.	0.195	0.128	0.558E-01	0.337E-01	0.517E-01	0.270E-01
	10000.	0.225	0.125	0.588E-01	0.385E-01	0.538E-01	0.309E-01
	20000.	0.265	0.929E-01	0.624E-01	0.436E-01	0.563E-01	0.351E-01
	30000.	0.293	0.737E-01	0.648E-01	0.470E-01	0.580E-01	0.378E-01
	50000.	0.323	0.593E-01	0.683E-01	0.512E-01	0.604E-01	0.413E-01
5P - 5D 50974.9 A C= 0.24E+19	3000.	0.375	0.114	0.113	0.286E-01	0.112	0.230E-01
	5000.	0.457	0.120	0.113	0.313E-01	0.112	0.253E-01
	10000.	0.623	0.102	0.114	0.353E-01	0.113	0.285E-01
	20000.	0.853	0.827E-01	0.115	0.397E-01	0.113	0.321E-01
	30000.	0.999	0.785E-01	0.116	0.425E-01	0.114	0.343E-01
	50000.	1.17	0.667E-01	0.117	0.463E-01	0.114	0.374E-01
5D - 6P 90873.6 A C= 0.69E+19	3000.	2.82	1.60	0.804	0.399	0.770	0.320
	5000.	3.25	1.62	0.823	0.439	0.782	0.353
	10000.	4.12	1.46	0.854	0.498	0.802	0.400
	20000.	5.38	1.16	0.893	0.561	0.828	0.453
	30000.	6.21	1.02	0.920	0.601	0.846	0.485
	50000.	7.12	0.867	0.959	0.656	0.872	0.530
5D - 7P 37123.9 A C= 0.57E+18	3000.	1.32	0.854	0.361	0.217	*0.333	*0.173
	5000.	1.45	0.896	0.375	0.240	0.344	0.192
	10000.	1.71	0.867	0.398	0.274	0.359	0.220
	20000.	2.04	0.643	0.425	0.311	0.379	0.250
	30000.	2.28	0.534	0.443	0.335	0.392	0.269
	50000.	2.53	0.400	0.469	0.365	0.411	0.295
PERTURBER DENSITY= 0.1D+17(cm-3)							
3P - 4S 3958.3 A C= 0.12E+20	3000.	0.209E-01	0.169E-01	0.525E-02	0.450E-02	0.428E-02	0.356E-02
	5000.	0.239E-01	0.191E-01	0.571E-02	0.503E-02	0.464E-02	0.400E-02
	10000.	0.279E-01	0.231E-01	0.639E-02	0.577E-02	0.519E-02	0.462E-02
	20000.	0.310E-01	0.263E-01	0.716E-02	0.657E-02	0.581E-02	0.528E-02
	30000.	0.317E-01	0.250E-01	0.765E-02	0.707E-02	0.621E-02	0.569E-02
	50000.	0.341E-01	0.248E-01	0.832E-02	0.775E-02	0.675E-02	0.624E-02
3P - 5S 2659.2 A C= 0.18E+19	3000.	0.471E-01	0.337E-01	0.104E-01	0.813E-02	*0.837E-02	*0.625E-02
	5000.	0.528E-01	0.392E-01	0.113E-01	0.938E-02	0.912E-02	0.733E-02
	10000.	0.585E-01	0.471E-01	0.127E-01	0.111E-01	0.102E-01	0.877E-02
	20000.	0.620E-01	0.454E-01	0.142E-01	0.128E-01	0.115E-01	0.102E-01
	30000.	0.650E-01	0.450E-01	0.152E-01	0.139E-01	0.123E-01	0.111E-01
	50000.	0.686E-01	0.388E-01	0.166E-01	0.153E-01	0.134E-01	0.123E-01
3P - 3D 3091.0 A C= 0.49E+18	3000.	0.392E-01	0.255E-01	0.102E-01	0.771E-02	0.848E-02	0.599E-02
	5000.	0.417E-01	0.236E-01	0.110E-01	0.880E-02	0.911E-02	0.692E-02
	10000.	0.432E-01	0.213E-01	0.122E-01	0.103E-01	0.101E-01	0.818E-02
	20000.	0.420E-01	0.179E-01	0.135E-01	0.118E-01	0.111E-01	0.946E-02
	30000.	0.407E-01	0.160E-01	0.145E-01	0.128E-01	0.118E-01	0.103E-01
	50000.	0.390E-01	0.128E-01	0.157E-01	0.140E-01	0.128E-01	0.113E-01

STARK BROADENING PARAMETER TABLES FOR Al I LINES OF ASTROPHYSICAL INTEREST

PERTURBER DENSITY= 0.1D+17(cm-3)							
TRANSITION	PERTURBERS ARE T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
3P - 4D 2601.0 A C= 0.12E+19	3000.	0.448E-01	0.315E-01	*0.139E-01	*0.751E-02	*0.127E-01	*0.578E-02
	5000.	0.500E-01	0.375E-01	0.146E-01	0.865E-02	*0.132E-01	*0.677E-02
	10000.	0.558E-01	0.416E-01	0.155E-01	0.102E-01	*0.140E-01	*0.809E-02
	20000.	0.611E-01	0.416E-01	0.166E-01	0.118E-01	0.147E-01	0.942E-02
	30000.	0.642E-01	0.386E-01	0.173E-01	0.128E-01	0.153E-01	0.102E-01
	50000.	0.693E-01	0.327E-01	0.183E-01	0.141E-01	0.160E-01	0.113E-01
3P - 5D 2372.4 A C= 0.52E+18	3000.	0.853E-01	0.428E-01	*0.290E-01	*0.931E-02		
	5000.	0.980E-01	0.477E-01	*0.300E-01	*0.109E-01		
	10000.	0.118	0.534E-01	*0.310E-01	*0.130E-01	*0.298E-01	*0.103E-01
	20000.	0.142	0.525E-01	*0.319E-01	*0.152E-01	*0.306E-01	*0.121E-01
	30000.	0.158	0.484E-01	0.325E-01	0.165E-01	*0.310E-01	*0.132E-01
	50000.	0.177	0.412E-01	0.334E-01	0.182E-01	*0.315E-01	*0.146E-01
3D - 5P 12759.1 A C= 0.84E+19	3000.	1.88	0.621	*0.595	*0.134		
	5000.	2.17	0.760	*0.607	*0.152	*0.595	*0.120
	10000.	2.59	0.849	*0.617	*0.178	*0.608	*0.142
	20000.	3.07	0.862	0.624	0.205	*0.615	*0.164
	30000.	3.37	0.763	0.629	0.222	*0.618	*0.178
	50000.	3.75	0.654	0.635	0.244	0.622	0.196
3D - 6P 9174.6 A C= 0.44E+19	3000.	2.94	1.64				
	5000.	3.31	1.94				
	10000.	3.88	1.88				
	20000.	4.58	1.74	*1.06	*0.585		
	30000.	5.07	1.53	*1.09	*0.642		
	50000.	5.64	1.27	*1.13	*0.715	*1.04	*0.570
3D - 7P 8004.5 A C= 0.27E+19	3000.	6.09	3.65				
	5000.	6.69	4.02				
	10000.	7.63	4.18				
	20000.	8.82	3.34				
	30000.	9.67	2.75				
	50000.	10.5	2.23				
4S - 4P 13147.3 A C= 0.90E+19	3000.	1.13	-0.473	0.266	-0.173	*0.233	*-0.134
	5000.	1.13	-0.372	0.283	-0.199	*0.246	*-0.156
	10000.	1.27	-0.291	0.308	-0.233	0.265	-0.185
	20000.	1.34	-0.222	0.337	-0.269	0.287	-0.215
	30000.	1.40	-0.175	0.356	-0.291	0.301	-0.234
	50000.	1.49	-0.131	0.383	-0.321	0.321	-0.258
4S - 5P 6699.8 A C= 0.78E+19	3000.	0.435	0.231	*0.178	*0.528E-01		
	5000.	0.490	0.268	*0.183	*0.610E-01	*0.177	*0.477E-01
	10000.	0.587	0.264	*0.188	*0.720E-01	*0.183	*0.571E-01
	20000.	0.724	0.247	0.192	0.834E-01	*0.186	*0.666E-01
	30000.	0.820	0.213	0.195	0.903E-01	*0.188	*0.723E-01
	50000.	0.947	0.179	0.199	0.994E-01	0.190	0.798E-01

PERTURBER DENSITY= 0.1D+17(cm-3)							
TRANSITION	PERTURBERS ARE T(K)	ELECTRONS WIDTH(A)	SHIFT(A)	PROTONS WIDTH(A)	SHIFT(A)	IONIZED HELIUM WIDTH(A)	SHIFT(A)
4S - 6P 5559.3 A C= 0.26E+19	3000.	1.03	0.636				
	5000.	1.15	0.717				
	10000.	1.34	0.739				
	20000.	1.60	0.635	*0.400	*0.222		
	30000.	1.79	0.566	*0.412	*0.244		
50000.	2.01	0.467		*0.429	*0.272		
4S - 7P 5106.9 A C= 0.11E+19	3000.	2.43	1.44				
	5000.	2.67	1.70				
	10000.	3.04	1.62				
	20000.	3.53	1.35				
	30000.	3.88	1.11				
50000.	4.24	0.882					
4P - 5S 21117.0 A C= 0.23E+20	3000.	5.42	3.04	*1.01	*0.702	*0.844	*0.533
	5000.	5.72	3.19	1.09	0.821	*0.908	*0.637
	10000.	6.00	3.31	1.21	0.979	*1.00	*0.773
	20000.	6.40	3.09	1.34	1.14	1.11	0.908
	30000.	6.67	2.67	1.42	1.24	1.17	0.989
50000.	7.29	2.19	1.54	1.37	1.27	1.10	
4P - 4D 17929.8 A C= 0.17E+20	3000.	3.84	2.13	*0.761	*0.496	*0.653	*0.377
	5000.	4.05	2.33	0.815	0.580	*0.697	*0.450
	10000.	4.25	2.19	0.894	0.691	*0.759	*0.545
	20000.	4.51	1.97	0.983	0.804	0.828	0.641
	30000.	4.74	1.69	1.04	0.873	0.873	0.698
50000.	5.13	1.38	1.12	0.963	0.935	0.772	
4P - 5D 10774.2 A C= 0.60E+19	3000.	2.36	1.06	*0.575	*0.231		
	5000.	2.64	1.21	*0.600	*0.273		
	10000.	3.04	1.17	*0.629	*0.330	*0.589	*0.259
	20000.	3.54	1.10	*0.660	*0.386	*0.612	*0.307
	30000.	3.88	0.960	0.679	0.420	*0.625	*0.335
50000.	4.32	0.800	0.708	0.464	*0.645	*0.372	
PERTURBER DENSITY= 0.1D+18(cm-3)							
3P - 4S 3958.3 A C= 0.12E+21	3000.	0.209	0.160	0.524E-01	0.364E-01	*0.425E-01	*0.270E-01
	5000.	0.239	0.185	0.570E-01	0.436E-01	*0.463E-01	*0.334E-01
	10000.	0.279	0.226	0.639E-01	0.530E-01	0.519E-01	0.415E-01
	20000.	0.310	0.262	0.716E-01	0.624E-01	0.581E-01	0.495E-01
	30000.	0.317	0.249	0.765E-01	0.679E-01	0.620E-01	0.542E-01
50000.	0.341	0.247	0.832E-01	0.752E-01	0.674E-01	0.602E-01	
3P - 5S 2659.2 A C= 0.18E+20	3000.	0.471	0.301				
	5000.	0.528	0.363	*0.112	*0.657E-01		
	10000.	0.585	0.451	*0.126	*0.908E-01		
	20000.	0.620	0.447	*0.142	*0.114	*0.115	*0.882E-01
	30000.	0.650	0.448	*0.152	*0.127	*0.123	*0.996E-01
50000.	0.686	0.388	*0.166	*0.144	*0.134	*0.114	

STARK BROADENING PARAMETER TABLES FOR ALL LINES OF ASTROPHYSICAL INTEREST

PERTURBER DENSITY= 0.1D+18(cm-3)							
TRANSITION	PERTURBERS ARE T(K)	ELECTRONS		PROTONS		IONIZED HELIUM	
		WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
3P - 3D	3000.	0.391	0.225	*0.988E-01	*0.499E-01		
3091.0 A	5000.	0.416	0.213	*0.109	*0.668E-01		
C= 0.49E+19	10000.	0.431	0.197	*0.121	*0.879E-01	*0.100	*0.668E-01
	20000.	0.419	0.178	*0.135	*0.108	*0.111	*0.841E-01
	30000.	0.407	0.159	*0.144	*0.119	*0.118	*0.939E-01
	50000.	0.389	0.127	0.157	0.134	*0.128	*0.106
3P - 4D	3000.	0.447	0.282				
2601.0 A	5000.	0.500	0.348				
C= 0.12E+20	10000.	0.558	0.398	*0.152	*0.841E-01		
	20000.	0.611	0.406	*0.165	*0.105		
	30000.	0.642	0.381	*0.172	*0.117		
	50000.	0.693	0.325	*0.183	*0.133	*0.160	*0.105
4S - 4P	3000.	11.2	-3.98				
13147.3 A	5000.	11.7	-3.13	*2.75	*-1.44		
C= 0.90E+20	10000.	12.7	-2.57	*3.05	*-1.95		
	20000.	13.3	-2.08	*3.36	*-2.42	*2.85	*-1.88
	30000.	14.0	-1.64	*3.55	*-2.69	*3.00	*-2.11
	50000.	14.9	-1.29	*3.82	*-3.03	*3.21	*-2.40
4S - 5P	3000.	4.34	2.07				
6699.8 A	5000.	4.89	2.50				
C= 0.78E+20	10000.	5.87	2.51				
	20000.	7.24	2.39				
	30000.	8.20	2.09				
	50000.	9.47	1.76	*1.98	*0.936		
4S - 6P	3000.	*10.1	*4.96				
5559.3 A	5000.	11.4	6.09				
C= 0.26E+20	10000.	13.4	6.64				
	20000.	16.0	5.90				
	30000.	17.9	5.44				
	50000.	20.1	4.50				
PERTURBER DENSITY= 0.1D+19(cm-3)							
3P - 4S	3000.	2.09	1.33				
3958.3 A	5000.	2.39	1.64	*0.545	*0.226		
C= 0.12E+22	10000.	2.79	2.11	*0.634	*0.381		
	20000.	3.10	2.50	*0.715	*0.518		
	30000.	3.17	2.41	*0.764	*0.594	*0.620	*0.456
	50000.	3.41	2.43	*0.832	*0.686	*0.674	*0.536
3P - 5S	3000.	*4.63	*1.83				
2659.2 A	5000.	*5.25	*2.72				
C= 0.18E+21	10000.	5.84	3.87				
	20000.	6.20	4.05				
	30000.	6.49	4.11				
	50000.	6.86	3.71				

PERTURBER DENSITY= $0.1 \times 10^{19} \text{ cm}^{-3}$				PROTONS		IONIZED HELIUM	
PERTURBERS ARE	ELECTRONS			WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)				
3P - 3D	3000.	3.39	1.37				
3091.0 A	5000.	3.74	1.45				
C= 0.49×10^{20}	10000.	4.00	1.48				
	20000.	3.96	1.41				
	30000.	3.88	1.29				
	50000.	3.75	1.13				
3P - 4D	3000.	*4.36	*1.75				
2601.0 A	5000.	*4.95	*2.58				
C= 0.12×10^{21}	10000.	5.56	3.39				
	20000.	6.10	3.71				
	30000.	6.41	3.51				
	50000.	6.92	3.11				

(1979) has been used.

Our results are shown in Table 1 for perturber densities $10^{13} - 10^{14} \text{ cm}^{-3}$; $10^{16} - 10^{19} \text{ cm}^{-3}$ and temperatures of $T = 3,000; 5,000; 10,000; 20,000; 30,000$ and $50,000 \text{ K}$. 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 it is divided by the electron-impact 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, 1969 a b). Values for $NV > 0.5$ are not given in Table 1; 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 formulae (cf. Sahal-Bréchet (1991) or Griem (1974)).

The analysis of present results and comparison with available experimental and theoretical data is given in Dimitrijević and Sahal - Bréchet (1992).

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ТАБЕЛЕ ПАРАМЕТАРА ШТАРКОВОГ ШИРЕЊА ЛИНИЈА AI I ОД
ЗНАЧАЈА У АСТРОФИЗИЦИ

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Користећи семикласичан прилаз, израчуна-
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