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Preliminary report

STARK BROADENING PARAMETER TABLES FOR Ne II AND Ne III SPECTRAL LINES

M. S. Dimitrijević

Astronomical Observatory, Volgina 7, 11160 Belgrade-74, Serbia, Yugoslavia

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SUMMARY: Using a semiclassical approach, we have calculated electron−, proton−, He II−, Mg II-, Si II- and Fe II-impact line widths and shifts for 10 Ne II and 6 Ne III multiplets as a function of temperature and perturber density. For Ne II temperatures are: 5,000 K; 10,000 K; 20,000 K; 30,000 K; 50,000 K and 100,000 K and perturber densities from 10^{15} cm^{-3} up to 10^{20} cm^{-3}. For Ne III temperatures are: 20,000 K; 50,000 K; 100,000 K; 200,000 K; 300,000 K and 500,000 K and perturber densities from 10^{17} cm^{-3} up to 10^{21} cm^{-3}. Perturbers selected here, are the main perturbers in solar and stellar atmospheres.

1. INTRODUCTION

Neon is the most abundant element in the universe after hydrogen, helium, oxygen and carbon, and it is for example (Trimble, 1991) one of the products of hydrogen and helium burning in the orderly evolution of stellar interiors. Moreover, after the hydrogen-, helium-, and carbon - burning periods end in massive stars, neon burning starts. We note as well that Ne III lines have been identified in the spectrum of a solar active region (Thomas and Neupert, 1994). In order to enlarge as much as possible the available set of reliable Stark broadening data needed for the astrophysical and laboratory plasmas research, as well as for plasmas in industry, Stark broadening of Ne II, Ne III and Ne IV spectral lines has been investigated experimentally and theoretically (Milosavljević, Dimitrijević and Djeniže, 2001; Djeniže, Milosavljević and Dimitrijević, 2001). In order to complete this research providing complete data for spectral lines where it is possible to do with our standard accuracy, we have calculated within the semiclassical-perturbation formalism (Sahal-Bréchot 1969ab, see also Sahal-Bréchot 1974, Fleurier, Sahal-Bréchot and Chapelle 1977, Dimitrijević and Sahal-Bréchot 1984, Dimitrijević, Sahal-Bréchot and Bommier 1991, Dimitrijević and Sahal-Bréchot 1995a) electron-, proton-, ionized helium-, ionized magnesium-, ionized silicon-, and ionized iron-impact line widths and shifts for 10 Ne II and 6 Ne III multiplets. Consequently, data for all principal perturbers in the solar plasma are provided.

2. RESULTS AND DISCUSSION

The used formalism has been reviewed briefly *e.g* in Dimitrijević and Sahal-Bréchot (1995ab). All relevant details concerning the obtained results and the calculation procedure are published in Milosavljević, Dimitrijević and Djeniže (2001); Djeniže, Milosavljević and Dimitrijević (2001) and Dimitrijević (2002). Here, we present only tables of Stark broadening parameters. Atomic energy levels needed for

Table 1. This Table shows electron-, proton-, and He II-impact broadening parameters for Ne II for perturber densities 10^{15}cm^{-3} - 10^{20}cm^{-3} and temperatures from 5,000 up to 100,000 K. Electron-impact widths for the electron density of 10^{15}cm^{-3} are from Milosavljević, Dimitrijević and Djeniže (2001) and electron-impact shifts for the same electron density from Djeniže, Milosavljević and Dimitrijević (2001). Stark broadening parameters for densities lower than for tabulated values, are linear with perturber density. Transitions and averaged wavelengths for the multiplet (in Å) are also given in the Table. By dividing C by the corresponding full width at half maximum (Dimitrijević, Sahal-Bréchot and Bommier 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 the 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+15 cm^{-3}							
Ne II	5000.	0.317E-02	-0.607E-05	0.594E-04	-0.351E-05	0.844E-04	-0.350E-05
3507.9 Å	10000.	0.230E-02	-0.156E-04	0.101E-03	-0.691E-05	0.124E-03	-0.670E-05
C=0.35E+19	20000.	0.168E-02	-0.194E-04	0.140E-03	-0.120E-04	0.154E-03	-0.111E-04
3s(2)P-	30000.	0.144E-02	-0.184E-04	0.154E-03	-0.156E-04	0.166E-03	-0.135E-04
3p(2)S	50000.	0.126E-02	-0.220E-04	0.169E-03	-0.198E-04	0.181E-03	-0.172E-04
	100000.	0.112E-02	-0.198E-04	0.188E-03	-0.249E-04	0.195E-03	-0.208E-04
Ne II	5000.	0.346E-02	0.626E-05	0.500E-04	-0.912E-05	0.727E-04	-0.901E-05
3725.1 Å	10000.	0.250E-02	-0.376E-04	0.894E-04	-0.172E-04	0.110E-03	-0.162E-04
C=0.37E+19	20000.	0.181E-02	-0.489E-04	0.127E-03	-0.280E-04	0.143E-03	-0.244E-04
3s(4)P-	30000.	0.153E-02	-0.442E-04	0.144E-03	-0.338E-04	0.155E-03	-0.297E-04
3p(4)P	50000.	0.131E-02	-0.540E-04	0.158E-03	-0.425E-04	0.169E-03	-0.352E-04
	100000.	0.113E-02	-0.456E-04	0.178E-03	-0.511E-04	0.184E-03	-0.424E-04
Ne II	5000.	0.284E-02	-0.434E-05	0.461E-04	-0.352E-05	0.664E-04	-0.350E-05
3343.3 Å	10000.	0.206E-02	-0.146E-04	0.804E-04	-0.689E-05	0.992E-04	-0.667E-05
C=0.30E+19	20000.	0.149E-02	-0.191E-04	0.113E-03	-0.119E-04	0.126E-03	-0.110E-04
3s(4)P-	30000.	0.127E-02	-0.182E-04	0.126E-03	-0.153E-04	0.136E-03	-0.132E-04
3p(4)D	50000.	0.108E-02	-0.216E-04	0.138E-03	-0.194E-04	0.148E-03	-0.168E-04
	100000.	0.947E-03	-0.189E-04	0.154E-03	-0.243E-04	0.161E-03	-0.202E-04
Ne II	5000.	0.233E-02	-0.559E-05	0.434E-04	0.130E-05	0.617E-04	0.130E-05
2988.3 Å	10000.	0.169E-02	0.166E-05	0.734E-04	0.259E-05	0.907E-04	0.255E-05
C=0.24E+19	20000.	0.123E-02	0.533E-05	0.102E-03	0.480E-05	0.112E-03	0.446E-05
3s(4)P-	30000.	0.105E-02	0.509E-05	0.112E-03	0.641E-05	0.121E-03	0.580E-05
3p(4)S	50000.	0.906E-03	0.635E-05	0.123E-03	0.834E-05	0.132E-03	0.740E-05
	100000.	0.799E-03	0.367E-05	0.137E-03	0.113E-04	0.142E-03	0.931E-05
PERTURBER DENSITY = 1.E+16 cm^{-3}							
Ne II	5000.	0.317E-01	-0.495E-04	0.593E-03	-0.337E-04	0.842E-03	-0.335E-04
3507.9 Å	10000.	0.230E-01	-0.153E-03	0.101E-02	-0.684E-04	0.124E-02	-0.663E-04
C=0.35E+20	20000.	0.168E-01	-0.192E-03	0.140E-02	-0.120E-03	0.154E-02	-0.111E-03
3s(2)P-	30000.	0.144E-01	-0.177E-03	0.154E-02	-0.156E-03	0.166E-02	-0.135E-03
3p(2)S	50000.	0.126E-01	-0.220E-03	0.169E-02	-0.198E-03	0.181E-02	-0.172E-03
	100000.	0.112E-01	-0.197E-03	0.188E-02	-0.249E-03	0.195E-02	-0.208E-03
Ne II	5000.	0.346E-01	-0.175E-04	0.499E-03	-0.873E-04	0.725E-03	-0.862E-04
3725.1 Å	10000.	0.250E-01	-0.389E-03	0.893E-03	-0.171E-03	0.110E-02	-0.160E-03
C=0.37E+20	20000.	0.181E-01	-0.491E-03	0.127E-02	-0.280E-03	0.143E-02	-0.244E-03
3s(4)P-	30000.	0.153E-01	-0.423E-03	0.144E-02	-0.338E-03	0.155E-02	-0.297E-03
3p(4)P	50000.	0.131E-01	-0.540E-03	0.158E-02	-0.425E-03	0.169E-02	-0.352E-03
	100000.	0.113E-01	-0.456E-03	0.178E-02	-0.511E-03	0.184E-02	-0.424E-03
Ne II	5000.	0.284E-01	-0.399E-04	0.460E-03	-0.337E-04	0.662E-03	-0.335E-04
3343.3 Å	10000.	0.206E-01	-0.145E-03	0.803E-03	-0.682E-04	0.991E-03	-0.660E-04
C=0.30E+20	20000.	0.149E-01	-0.191E-03	0.113E-02	-0.119E-03	0.126E-02	-0.110E-03
3s(4)P-	30000.	0.127E-01	-0.174E-03	0.126E-02	-0.153E-03	0.136E-02	-0.132E-03
3p(4)D	50000.	0.108E-01	-0.216E-03	0.138E-02	-0.194E-03	0.148E-02	-0.168E-03
	100000.	0.947E-02	-0.189E-03	0.154E-02	-0.243E-03	0.161E-02	-0.202E-03
Ne II	5000.	0.233E-01	-0.270E-04	0.433E-03	0.124E-04	0.615E-03	0.124E-04
2988.3 Å	10000.	0.169E-01	0.274E-04	0.734E-03	0.257E-04	0.906E-03	0.253E-04
C=0.24E+20	20000.	0.123E-01	0.546E-04	0.102E-02	0.479E-04	0.112E-02	0.446E-04
3s(4)P-	30000.	0.105E-01	0.444E-04	0.112E-02	0.640E-04	0.121E-02	0.580E-04
3p(4)S	50000.	0.906E-02	0.635E-04	0.123E-02	0.834E-04	0.132E-02	0.740E-04
	100000.	0.799E-02	0.367E-04	0.137E-02	0.113E-03	0.142E-02	0.931E-04

Table 1. (continued)

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+17 cm^{-3}							
Ne II	5000.	0.351	-0.113E-02	0.608E-02	-0.641E-03	0.865E-02	-0.634E-03
3714.1 Å	10000.	0.254	-0.287E-02	0.106E-01	-0.135E-02	0.130E-01	-0.128E-02
C=0.37E+21	20000.	0.186	-0.394E-02	0.149E-01	-0.236E-02	0.165E-01	-0.207E-02
3s(2)P-	30000.	0.159	-0.379E-02	0.165E-01	-0.286E-02	0.178E-01	-0.253E-02
3p(2)D	50000.	0.138	-0.455E-02	0.181E-01	-0.368E-02	0.193E-01	-0.307E-02
	100000.	0.122	-0.381E-02	0.202E-01	-0.444E-02	0.209E-01	-0.371E-02
Ne II	5000.	0.295	-0.107E-02	0.565E-02	0.112E-04	0.795E-02	0.112E-04
3342.7 Å	10000.	0.214	-0.583E-03	0.959E-02	0.251E-04	0.118E-01	0.251E-04
C=0.30E+21	20000.	0.157	-0.473E-03	0.134E-01	0.527E-04	0.146E-01	0.524E-04
3s(2)P-	30000.	0.135	-0.323E-03	0.146E-01	0.784E-04	0.158E-01	0.768E-04
3p(2)P	50000.	0.118	-0.362E-03	0.160E-01	0.124E-03	0.171E-01	0.117E-03
	100000.	0.105	-0.595E-03	0.178E-01	0.202E-03	0.184E-01	0.176E-03
Ne II	5000.	0.346	0.264E-04	0.492E-02	-0.774E-03	0.711E-02	-0.764E-03
3725.1 Å	10000.	0.250	-0.365E-02	0.890E-02	-0.162E-02	0.110E-01	-0.151E-02
C=0.37E+21	20000.	0.181	-0.480E-02	0.127E-01	-0.276E-02	0.143E-01	-0.240E-02
3s(4)P-	30000.	0.153	-0.432E-02	0.144E-01	-0.335E-02	0.155E-01	-0.294E-02
3p(4)P	50000.	0.131	-0.543E-02	0.158E-01	-0.424E-02	0.169E-01	-0.351E-02
	100000.	0.113	-0.455E-02	0.178E-01	-0.511E-02	0.184E-01	-0.424E-02
Ne II	5000.	0.284	-0.351E-03	0.453E-02	-0.299E-03	0.649E-02	-0.298E-03
3343.3 Å	10000.	0.206	-0.136E-02	0.800E-02	-0.648E-03	0.986E-02	-0.626E-03
C=0.30E+21	20000.	0.149	-0.187E-02	0.113E-01	-0.117E-02	0.126E-01	-0.108E-02
3s(4)P-	30000.	0.127	-0.178E-02	0.126E-01	-0.152E-02	0.136E-01	-0.131E-02
3p(4)D	50000.	0.108	-0.216E-02	0.138E-01	-0.194E-02	0.148E-01	-0.168E-02
	100000.	0.947E-01	-0.189E-02	0.154E-01	-0.243E-02	0.161E-01	-0.202E-02
Ne II	5000.	0.233	-0.391E-03	0.426E-02	0.110E-03	0.602E-02	0.110E-03
2988.3 Å	10000.	0.169	0.211E-03	0.731E-02	0.244E-03	0.901E-02	0.240E-03
C=0.24E+21	20000.	0.123	0.517E-03	0.102E-01	0.474E-03	0.112E-01	0.440E-03
3s(4)P-	30000.	0.105	0.493E-03	0.112E-01	0.636E-03	0.121E-01	0.575E-03
3p(4)S	50000.	0.906E-01	0.652E-03	0.123E-01	0.833E-03	0.132E-01	0.739E-03
	100000.	0.799E-01	0.366E-03	0.137E-01	0.113E-02	0.142E-01	0.931E-03
Ne II	5000.	0.455	0.190	0.828E-02	0.106E-01	0.872E-02	0.884E-02
2785.2 Å	10000.	0.317	0.147	0.148E-01	0.166E-01	0.150E-01	0.139E-01
C=0.64E+20	20000.	0.232	0.113	0.225E-01	0.222E-01	0.199E-01	0.183E-01
3p(4)P-	30000.	0.209	0.101	0.260E-01	0.248E-01	0.225E-01	0.204E-01
4s(4)P	50000.	0.192	0.846E-01	0.306E-01	0.287E-01	0.264E-01	0.236E-01
	100000.	0.176	0.658E-01	0.369E-01	0.335E-01	0.319E-01	0.278E-01
Ne II	5000.	0.539	0.222	0.101E-01	0.125E-01	0.107E-01	0.105E-01
3045.3 Å	10000.	0.376	0.171	0.179E-01	0.196E-01	0.182E-01	0.164E-01
C=0.77E+20	20000.	0.276	0.129	0.268E-01	0.263E-01	0.239E-01	0.216E-01
3p(4)D-	30000.	0.250	0.117	0.311E-01	0.293E-01	0.272E-01	0.242E-01
4s(4)P	50000.	0.230	0.968E-01	0.366E-01	0.339E-01	0.319E-01	0.279E-01
	100000.	0.213	0.761E-01	0.438E-01	0.396E-01	0.376E-01	0.329E-01
PERTURBER DENSITY = 1.E+18 cm^{-3}							
Ne II	5000.	0.292E-01	0.108E-01	0.478E-04	0.182E-03	0.684E-04	0.171E-03
446.6 Å	10000.	0.206E-01	0.833E-02	0.211E-03	0.460E-03	0.250E-03	0.416E-03
C=0.56E+20	20000.	0.142E-01	0.649E-02	0.520E-03	0.760E-03	0.509E-03	0.658E-03
2p(5)(2)P-	30000.	0.115E-01	0.541E-02	0.754E-03	0.967E-03	0.730E-03	0.807E-03
3s(2)P	50000.	0.944E-02	0.464E-02	0.106E-02	0.116E-02	0.930E-03	0.962E-03
	100000.	0.768E-02	0.377E-02	0.140E-02	0.142E-02	0.119E-02	0.118E-02
Ne II	5000.	3.51	-0.865E-02	0.506E-01	-0.422E-02	0.674E-01	-0.415E-02
3714.1 Å	10000.	2.54	-0.276E-01	0.103	-0.118E-01	0.124	-0.110E-01
C=0.37E+22	20000.	1.86	-0.382E-01	0.147	-0.220E-01	0.162	-0.191E-01
3s(2)P-	30000.	1.59	-0.358E-01	0.164	-0.275E-01	0.177	-0.242E-01
3p(2)D	50000.	1.38	-0.446E-01	0.181	-0.361E-01	0.193	-0.301E-01
	100000.	1.22	-0.372E-01	0.202	-0.442E-01	0.209	-0.370E-01

Table 1. (continued)

PERTURBERS ARE:		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne II	5000.	2.95	-0.106E-01	0.467E-01	0.742E-04	*0.612E-01	*0.742E-04
3342.7 Å	10000.	2.14	-0.559E-02	0.928E-01	0.221E-03	*0.112	*0.220E-03
C=0.30E+22	20000.	1.57	-0.492E-02	0.132	0.498E-03	0.144	0.495E-03
3s(2)P-	30000.	1.35	-0.358E-02	0.145	0.764E-03	0.157	0.748E-03
3p(2)P	50000.	1.18	-0.360E-02	0.160	0.123E-02	0.171	0.116E-02
	100000.	1.05	-0.599E-02	0.178	0.201E-02	0.184	0.176E-02
Ne II	10000.	2.30	-0.139E-01	0.970E-01	-0.568E-02	*0.117	-0.547E-02
3507.9 Å	20000.	1.68	-0.184E-01	0.139	-0.111E-01	0.151	-0.102E-01
C=0.35E+22	30000.	1.44	-0.172E-01	0.153	-0.149E-01	0.165	-0.128E-01
3s(2)P-	50000.	1.26	-0.215E-01	0.169	-0.195E-01	0.180	-0.169E-01
3p(2)S	100000.	1.12	-0.194E-01	0.188	-0.248E-01	0.195	-0.207E-01
	5000.	3.47	0.443E-02	0.413E-01	-0.509E-02	0.564E-01	-0.498E-02
Ne II	10000.	2.50	-0.349E-01	0.865E-01	-0.140E-01	0.105	-0.130E-01
3725.1 Å	20000.	1.81	-0.465E-01	0.126	-0.256E-01	0.141	-0.220E-01
C=0.37E+22	30000.	1.53	-0.415E-01	0.143	-0.321E-01	0.154	-0.280E-01
3s(4)P-	50000.	1.31	-0.528E-01	0.158	-0.417E-01	0.168	-0.344E-01
3p(4)P	100000.	1.13	-0.445E-01	0.178	-0.510E-01	0.184	-0.423E-01
	5000.	2.84	-0.181E-02	0.378E-01	-0.197E-02	0.509E-01	-0.196E-02
Ne II	10000.	2.06	-0.130E-01	0.776E-01	-0.566E-02	0.941E-01	-0.543E-02
3343.3 Å	20000.	1.49	-0.183E-01	0.112	-0.110E-01	0.124	-0.101E-01
C=0.30E+22	30000.	1.27	-0.169E-01	0.126	-0.146E-01	0.135	-0.126E-01
3s(4)P-	50000.	1.08	-0.211E-01	0.138	-0.191E-01	0.148	-0.165E-01
3p(4)D	100000.	0.947	-0.185E-01	0.154	-0.242E-01	0.161	-0.201E-01
	5000.	2.33	-0.400E-02	0.353E-01	0.728E-03	*0.466E-01	*0.727E-03
Ne II	10000.	1.69	0.200E-02	0.707E-01	0.214E-02	*0.857E-01	*0.210E-02
2988.3 Å	20000.	1.23	0.491E-02	0.101	0.446E-02	0.110	0.412E-02
C=0.24E+22	30000.	1.05	0.457E-02	0.112	0.616E-02	0.120	0.556E-02
3s(4)P-	50000.	0.906	0.636E-02	0.123	0.822E-02	0.131	0.728E-02
3p(4)S	100000.	0.799	0.348E-02	0.137	0.113E-01	0.142	0.929E-02
	5000.	*4.55	*1.82	*0.752E-01	*0.543E-01	*0.732E-01	*0.367E-01
Ne II	10000.	3.17	1.42	*0.147	*0.124	*0.146	*0.961E-01
2785.2 Å	20000.	2.32	1.09	*0.223	*0.183	*0.196	*0.144
C=0.64E+21	30000.	2.09	0.980	*0.258	*0.221	*0.227	*0.178
3p(4)P-	50000.	1.92	0.824	*0.307	*0.273	*0.264	*0.222
4s(4)P	100000.	1.76	0.642	0.369	0.332	0.319	0.275
	5000.	*5.39	*2.13	*0.907E-01	*0.644E-01	*0.885E-01	*0.437E-01
Ne II	10000.	3.76	1.65	*0.177	*0.147	*0.176	*0.114
3045.3 Å	20000.	2.76	1.25	*0.268	*0.217	*0.236	*0.170
C=0.77E+21	30000.	2.50	1.14	*0.310	*0.261	*0.273	*0.212
3p(4)D-	50000.	2.30	0.942	*0.367	*0.323	*0.319	*0.262
4s(4)P	100000.	2.13	0.742	0.438	0.392	0.376	0.326
	5000.	*6.68	*2.59	*0.116	*0.800E-01	*0.113	*0.546E-01
Ne II	10000.	4.68	1.99	*0.224	*0.182	*0.225	*0.142
3414.8 Å	20000.	3.45	1.50	*0.337	*0.269	*0.301	*0.211
C=0.97E+21	30000.	3.14	1.37	*0.390	*0.325	*0.342	*0.262
3p(4)S-	50000.	2.91	1.13	*0.462	*0.401	*0.404	*0.328
4s(4)P	100000.	2.71	0.888	0.551	0.485	*0.467	*0.401
PERTURBER DENSITY = 1.E+19 cm^{-3}							
Ne II	5000.	*0.292	*0.102	*0.368E-03	*0.438E-03	*0.478E-03	*0.338E-03
446.6 Å	10000.	0.206	0.799E-01	0.204E-02	0.248E-02	*0.237E-02	*0.205E-02
C=0.56E+21	20000.	0.142	0.627E-01	0.519E-02	0.582E-02	*0.506E-02	*0.481E-02
2p(5)(2)P-	30000.	0.115	0.524E-01	0.751E-02	0.801E-02	*0.726E-02	*0.640E-02
3s(2)P	50000.	0.944E-01	0.450E-01	0.106E-01	0.101E-01	*0.926E-02	*0.812E-02
	100000.	0.769E-01	0.367E-01	0.140E-01	0.136E-01	0.118E-01	0.112E-01
Ne II	5000.						
3343.3 Å	10000.						
C=0.30E+23	20000.	14.9	-0.159	*1.04	-0.915E-01		
3s(4)P-	30000.	12.7	-0.151	*1.19	-0.129		
3p(4)D	50000.	10.8	-0.197	*1.35	-0.175	*1.43	-0.150
	100000.	9.47	-0.175	*1.54	-0.236	*1.59	-0.195

Table 1. (continued)

PERTURBERS ARE:		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne II	5000.						
2988.3 Å	10000.						
C=0.24E+23	20000.	12.3	0.401E-01	*0.930	*0.379E-01		
3s(4)P-	30000.	10.5	0.379E-01	*1.06	*0.553E-01		
3p(4)S	50000.	9.06	0.579E-01	*1.20	*0.766E-01		
	100000.	7.99	0.311E-01	*1.36	*0.110	*1.41	*0.906E-01
PERTURBER DENSITY = 1.E+20 cm^{-3}							
Ne II	5000.						
446.6 Å	10000.						
C=0.56E+22	20000.						
2p(5)(2)P-	30000.						
3s(2)P	50000.	0.944	0.406				
	100000.	0.768	0.337	*0.139	*0.104		

Table 2. This Table shows Mg II-, Si II-, and Fe II-impact broadening parameters for Ne II for perturber densities 10^{17}cm^{-3} - 10^{19}cm^{-3} and temperatures from 5,000 up to 100,000 K. Stark broadening parameters for densities lower than for tabulated values, are linear with perturber density. Transitions and averaged wavelengths for the multiplet (in Å) are also given in the Table. By dividing C by the corresponding full width at half maximum (Dimitrijević, Sahal-Bréchot and Bommier 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 the validity of the impact approximation lies between 0.1 and 0.5.

PERTURBER DENSITY = 1.E+17 cm^{-3}

PERTURBERS ARE:		IONIZED MAGNESIUM		IONIZED SILICON		IONIZED IRON	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne II	5000.	0.942E-05	0.254E-04	0.953E-05	0.253E-04	0.988E-05	0.249E-04
446.6 Å	10000.	0.276E-04	0.435E-04	0.276E-04	0.431E-04	0.275E-04	0.419E-04
C=0.56E+19	20000.	0.498E-04	0.638E-04	0.498E-04	0.633E-04	0.497E-04	0.612E-04
2p(5)(2)P-	30000.	0.646E-04	0.713E-04	0.642E-04	0.707E-04	0.623E-04	0.683E-04
3s(2)P	50000.	0.802E-04	0.834E-04	0.799E-04	0.824E-04	0.772E-04	0.795E-04
	100000.	0.101E-03	0.991E-04	0.100E-03	0.985E-04	0.971E-04	0.942E-04
Ne II	5000.	0.109E-01	-0.620E-03	0.110E-01	-0.619E-03	0.114E-01	-0.615E-03
3714.1 Å	10000.	0.153E-01	-0.119E-02	0.154E-01	-0.118E-02	0.157E-01	-0.117E-02
C=0.37E+21	20000.	0.177E-01	-0.182E-02	0.178E-01	-0.181E-02	0.180E-01	-0.177E-02
3s(2)P-	30000.	0.189E-01	-0.221E-02	0.190E-01	-0.219E-02	0.192E-01	-0.213E-02
3p(2)D	50000.	0.204E-01	-0.257E-02	0.204E-01	-0.255E-02	0.206E-01	-0.248E-02
	100000.	0.215E-01	-0.311E-02	0.214E-01	-0.306E-02	0.215E-01	-0.296E-02
Ne II	5000.	0.987E-02	0.112E-04	0.997E-02	0.112E-04	0.103E-01	0.112E-04
3342.7 Å	10000.	0.137E-01	0.251E-04	0.138E-01	0.251E-04	0.140E-01	0.251E-04
C=0.30E+21	20000.	0.157E-01	0.518E-04	0.158E-01	0.517E-04	0.160E-01	0.515E-04
3s(2)P-	30000.	0.168E-01	0.744E-04	0.169E-01	0.742E-04	0.171E-01	0.736E-04
3p(2)P	50000.	0.180E-01	0.109E-03	0.181E-01	0.108E-03	0.182E-01	0.107E-03
	100000.	0.188E-01	0.157E-03	0.189E-01	0.156E-03	0.190E-01	0.152E-03
Ne II	5000.	0.103E-01	-0.295E-03	0.104E-01	-0.294E-03	0.108E-01	-0.294E-03
3507.9 Å	10000.	0.144E-01	-0.598E-03	0.145E-01	-0.595E-03	0.147E-01	-0.587E-03
C=0.35E+21	20000.	0.166E-01	-0.976E-03	0.166E-01	-0.968E-03	0.168E-01	-0.941E-03
3s(2)P-	30000.	0.177E-01	-0.119E-02	0.178E-01	-0.118E-02	0.180E-01	-0.115E-02
3p(2)S	50000.	0.190E-01	-0.146E-02	0.191E-01	-0.144E-02	0.192E-01	-0.139E-02
	100000.	0.199E-01	-0.174E-02	0.200E-01	-0.173E-02	0.200E-01	-0.166E-02
Ne II	5000.	0.922E-02	-0.743E-03	0.932E-02	-0.741E-03	0.966E-02	-0.736E-03
3725.1 Å	10000.	0.131E-01	-0.141E-02	0.132E-01	-0.140E-02	0.136E-01	-0.138E-02
C=0.37E+21	20000.	0.154E-01	-0.213E-02	0.154E-01	-0.212E-02	0.156E-01	-0.207E-02
3s(4)P-	30000.	0.165E-01	-0.256E-02	0.165E-01	-0.253E-02	0.167E-01	-0.245E-02
3p(4)P	50000.	0.178E-01	-0.296E-02	0.179E-01	-0.294E-02	0.180E-01	-0.284E-02
	100000.	0.188E-01	-0.356E-02	0.189E-01	-0.350E-02	0.189E-01	-0.338E-02
Ne II	5000.	0.828E-02	-0.294E-03	0.836E-02	-0.294E-03	0.866E-02	-0.293E-03
3343.3 Å	10000.	0.117E-01	-0.591E-03	0.118E-01	-0.589E-03	0.120E-01	-0.580E-03
C=0.30E+21	20000.	0.136E-01	-0.955E-03	0.136E-01	-0.947E-03	0.138E-01	-0.921E-03
3s(4)P-	30000.	0.145E-01	-0.117E-02	0.145E-01	-0.116E-02	0.147E-01	-0.113E-02
3p(4)D	50000.	0.156E-01	-0.141E-02	0.157E-01	-0.140E-02	0.158E-01	-0.135E-02
	100000.	0.164E-01	-0.170E-02	0.164E-01	-0.168E-02	0.165E-01	-0.163E-02
Ne II	5000.	0.753E-02	0.110E-03	0.760E-02	0.110E-03	0.787E-02	0.110E-03
2988.3 Å	10000.	0.105E-01	0.233E-03	0.106E-01	0.233E-03	0.107E-01	0.231E-03
C=0.24E+21	20000.	0.121E-01	0.411E-03	0.121E-01	0.409E-03	0.123E-01	0.401E-03
3s(4)P-	30000.	0.129E-01	0.502E-03	0.130E-01	0.498E-03	0.131E-01	0.486E-03
3p(4)S	50000.	0.139E-01	0.646E-03	0.139E-01	0.640E-03	0.140E-01	0.623E-03
	100000.	0.145E-01	0.785E-03	0.145E-01	0.779E-03	0.146E-01	0.750E-03
Ne II	5000.	0.912E-02	0.759E-02	0.916E-02	0.752E-02	0.919E-02	0.723E-02
2785.2 Å	10000.	0.139E-01	0.112E-01	0.139E-01	0.110E-01	0.136E-01	0.106E-01
C=0.64E+20	20000.	0.177E-01	0.152E-01	0.176E-01	0.150E-01	0.172E-01	0.144E-01
3p(4)P-	30000.	0.202E-01	0.170E-01	0.201E-01	0.168E-01	0.194E-01	0.162E-01
4s(4)P	50000.	0.232E-01	0.197E-01	0.232E-01	0.193E-01	0.218E-01	0.185E-01
	100000.	0.259E-01	0.224E-01	0.261E-01	0.226E-01	0.265E-01	0.213E-01

Table 2. (continued)

PERTURBERS ARE:		IONIZED MAGNESIUM		IONIZED SILICON		IONIZED IRON	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne II	5000.	0.113E-01	0.898E-02	0.113E-01	0.889E-02	0.114E-01	0.856E-02
3045.3 Å	10000.	0.170E-01	0.132E-01	0.169E-01	0.131E-01	0.165E-01	0.125E-01
C=0.77E+20	20000.	0.213E-01	0.179E-01	0.214E-01	0.178E-01	0.209E-01	0.171E-01
3p(4)D-	30000.	0.245E-01	0.202E-01	0.243E-01	0.199E-01	0.235E-01	0.192E-01
4s(4)P	50000.	0.279E-01	0.232E-01	0.279E-01	0.230E-01	0.264E-01	0.219E-01
	100000.	0.314E-01	0.265E-01	0.308E-01	0.266E-01	0.318E-01	0.254E-01
Ne II	5000.	0.149E-01	0.111E-01	0.149E-01	0.110E-01	0.151E-01	0.106E-01
3414.8 Å	10000.	0.218E-01	0.164E-01	0.218E-01	0.162E-01	0.214E-01	0.155E-01
C=0.97E+20	20000.	0.275E-01	0.222E-01	0.273E-01	0.220E-01	0.270E-01	0.212E-01
3p(4)S-	30000.	0.312E-01	0.251E-01	0.311E-01	0.247E-01	0.300E-01	0.238E-01
4s(4)P	50000.	0.353E-01	0.288E-01	0.352E-01	0.285E-01	0.335E-01	0.270E-01
	100000.	0.399E-01	0.327E-01	0.390E-01	0.326E-01	0.402E-01	0.316E-01
PERTURBER DENSITY = 1.E+18 cm^{-3}							
Ne II	5000.	0.924E-04	0.155E-03	0.935E-04	0.154E-03	0.967E-04	0.150E-03
446.6 Å	10000.	0.276E-03	0.355E-03	0.276E-03	0.351E-03	0.274E-03	0.338E-03
C=0.56E+20	20000.	0.500E-03	0.564E-03	0.498E-03	0.558E-03	0.498E-03	0.539E-03
2p(5)(2)P-	30000.	0.644E-03	0.661E-03	0.642E-03	0.657E-03	0.620E-03	0.634E-03
3s(2)P	50000.	0.802E-03	0.807E-03	0.799E-03	0.797E-03	0.772E-03	0.767E-03
	100000.	0.101E-02	0.985E-03	0.100E-02	0.979E-03	0.971E-03	0.937E-03
Ne II	5000.	*0.753E-01	-0.401E-02	*0.753E-01	-0.400E-02	*0.751E-01	-0.396E-02
3714.1 Å	10000.	*0.142	-0.101E-01	*0.143	-0.100E-01	*0.144	-0.987E-02
C=0.37E+22	20000.	*0.172	-0.166E-01	*0.173	-0.165E-01	*0.174	-0.161E-01
3s(2)P-	30000.	*0.187	-0.210E-01	*0.187	-0.208E-01	*0.189	-0.202E-01
3p(2)D	50000.	*0.203	-0.251E-01	*0.203	-0.249E-01	*0.205	-0.241E-01
	100000.	0.214	-0.309E-01	*0.214	-0.304E-01	*0.215	-0.295E-01
Ne II	5000.	*0.663E-01	*0.742E-04	*0.663E-01	*0.742E-04	0.660E-01	*0.742E-04
3342.7 Å	10000.	*0.127	*0.220E-03	*0.127	*0.220E-03	0.128	*0.220E-03
C=0.30E+22	20000.	*0.153	*0.489E-03	*0.153	*0.488E-03	0.154	*0.486E-03
3s(2)P-	30000.	*0.166	*0.723E-03	*0.167	*0.722E-03	0.168	*0.716E-03
3p(2)P	50000.	*0.180	*0.108E-02	*0.180	*0.107E-02	0.181	*0.106E-02
	100000.	*0.188	*0.156E-02	*0.189	*0.155E-02	0.189	*0.152E-02
Ne II	5000.	*0.702E-01	-0.193E-02	*0.702E-01	-0.193E-02	*0.700E-01	-0.192E-02
3507.9 Å	10000.	*0.133	-0.515E-02	*0.134	-0.513E-02	*0.135	-0.504E-02
C=0.35E+22	20000.	*0.161	-0.900E-02	*0.161	-0.892E-02	*0.163	-0.864E-02
3s(2)P-	30000.	*0.175	-0.114E-01	*0.175	-0.113E-01	*0.177	-0.110E-01
3p(2)S	50000.	*0.190	-0.143E-01	*0.190	-0.141E-01	*0.191	-0.136E-01
	100000.	*0.199	-0.174E-01	*0.200	-0.172E-01	*0.200	-0.166E-01
Ne II	5000.	*0.660E-01	-0.477E-02	*0.661E-01	-0.476E-02	*0.663E-01	-0.470E-02
3725.1 Å	10000.	*0.123	-0.119E-01	*0.123	-0.118E-01	*0.126	-0.116E-01
C=0.37E+22	20000.	*0.150	-0.194E-01	*0.151	-0.192E-01	*0.152	-0.187E-01
3s(4)P-	30000.	*0.163	-0.242E-01	*0.163	-0.239E-01	*0.165	-0.231E-01
3p(4)P	50000.	*0.177	-0.289E-01	*0.178	-0.287E-01	*0.179	-0.276E-01
	100000.	0.188	-0.355E-01	0.189	-0.349E-01	0.189	-0.337E-01
Ne II	5000.	*0.579E-01	-0.192E-02	*0.579E-01	-0.192E-02	*0.579E-01	-0.191E-02
3343.3 Å	10000.	*0.109	-0.509E-02	*0.109	-0.506E-02	*0.111	-0.498E-02
C=0.30E+22	20000.	*0.132	-0.878E-02	*0.132	-0.870E-02	*0.134	-0.844E-02
3s(4)P-	30000.	*0.143	-0.111E-01	*0.144	-0.110E-01	*0.145	-0.107E-01
3p(4)D	50000.	*0.156	-0.138E-01	*0.156	-0.137E-01	*0.157	-0.132E-01
	100000.	0.164	-0.170E-01	0.164	-0.167E-01	0.165	-0.162E-01
Ne II	5000.	*0.512E-01	*0.723E-03	*0.511E-01	*0.723E-03	*0.510E-01	*0.721E-03
2988.3 Å	10000.	*0.973E-01	*0.203E-02	*0.976E-01	*0.202E-02	*0.982E-01	*0.201E-02
C=0.24E+22	20000.	*0.117	*0.383E-02	*0.118	*0.381E-02	*0.119	*0.373E-02
3s(4)P-	30000.	*0.127	*0.482E-02	*0.128	*0.478E-02	*0.129	*0.466E-02
3p(4)S	50000.	*0.138	*0.635E-02	*0.138	*0.630E-02	*0.139	*0.613E-02
	100000.	*0.145	*0.783E-02	*0.145	*0.777E-02	*0.146	*0.748E-02
Ne II	5000.						
2785.2 Å	10000.						
C=0.64E+21	20000.						
3p(4)P-	30000.						
4s(4)P	50000.	*0.232	*0.182	*0.231	*0.178	*0.218	*0.170
	100000.	*0.259	*0.222	*0.261	*0.224	*0.265	*0.210

Table 2. (continued)

PERTURBERS ARE:		IONIZED MAGNESIUM		IONIZED SILICON		IONIZED IRON	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne II	5000.						
3045.3 Å	10000.						
C=0.77E+21	20000.						
3p(4)D-	30000.						
4s(4)P	50000.	*0.279	*0.215	*0.279	*0.212		
	100000.	*0.314	*0.262	*0.308	*0.262	*0.317	*0.251
Ne II	5000.						
3414.8 Å	10000.						
C=0.97E+21	20000.						
3p(4)S-	30000.						
4s(4)P	50000.	*0.353	*0.266	*0.351	*0.264		
	100000.	*0.399	*0.323	*0.390	*0.322	*0.402	*0.312
PERTURBER DENSITY = 1.E+19 cm^{-3}							
Ne II	5000.	*0.554E-03	*0.196E-03	*0.553E-03	*0.186E-03	*0.540E-03	*0.151E-03
446.6 Å	10000.	*0.252E-02	*0.144E-02	*0.251E-02	*0.140E-02	*0.247E-02	*0.128E-02
C=0.56E+21	20000.	*0.492E-02	*0.387E-02	*0.492E-02	*0.382E-02	*0.490E-02	*0.361E-02
2p(5)(2)P-	30000.	*0.645E-02	*0.495E-02	*0.641E-02	*0.488E-02	*0.620E-02	*0.466E-02
3s(2)P	50000.	*0.801E-02	*0.656E-02	*0.793E-02	*0.647E-02	*0.770E-02	*0.615E-02
	100000.	*0.101E-01	*0.925E-02	*0.101E-01	*0.916E-02	*0.972E-02	*0.877E-02

Table 3. This Table shows electron-, proton-, and He II-impact broadening parameters for Ne III for perturber densities 10^{18}cm^{-3} - 10^{21}cm^{-3} and temperatures from 20,000 up to 500,000 K. Stark broadening parameters for densities lower than for tabulated values, are linear with perturber density.Transitions and averaged wavelengths for the multiplet (in Å) are also given in the Table. By dividing C by the corresponding full width at half maximum (Dimitrijević, Sahal-Bréchot and Bommier 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 the validity of the impact approximation lies between 0.1 and 0.5.

PERTURBER DENSITY = 1.E+18 cm^{-3}

PERTURBERS ARE:		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne III	20000.	0.916	-0.105E-01	0.171E-01	-0.475E-02	0.240E-01	-0.458E-02
2593.1 Å	50000.	0.594	-0.112E-01	0.326E-01	-0.107E-01	0.394E-01	-0.943E-02
C=0.26E+22	100000.	0.450	-0.163E-01	0.436E-01	-0.154E-01	0.464E-01	-0.133E-01
3s(5)S-	200000.	0.361	-0.143E-01	0.500E-01	-0.195E-01	0.524E-01	-0.163E-01
3p(5)P	300000.	0.324	-0.146E-01	0.539E-01	-0.218E-01	0.555E-01	-0.182E-01
	500000.	0.288	-0.137E-01	0.581E-01	-0.250E-01	0.581E-01	-0.204E-01
Ne III	20000.	0.712	-0.717E-03	0.258E-01	0.668E-05	0.333E-01	0.668E-05
2162.6 Å	50000.	0.469	-0.501E-04	0.436E-01	0.186E-04	0.491E-01	0.186E-04
C=0.17E+22	100000.	0.360	-0.699E-04	0.517E-01	0.380E-04	0.557E-01	0.379E-04
3p(5)P-	200000.	0.294	0.449E-03	0.582E-01	0.754E-04	0.617E-01	0.739E-04
3d(5)D	300000.	0.268	0.209E-03	0.616E-01	0.109E-03	0.636E-01	0.104E-03
	500000.	0.242	0.233E-03	0.640E-01	0.160E-03	0.656E-01	0.147E-03
Ne III	20000.	0.738E-02	0.563E-03	0.356E-04	0.136E-03	0.483E-04	0.127E-03
313.4 Å	50000.	0.439E-02	0.578E-03	0.169E-03	0.276E-03	0.158E-03	0.241E-03
C=0.37E+20	100000.	0.318E-02	0.608E-03	0.304E-03	0.391E-03	0.289E-03	0.324E-03
2p(4)(3)P-	200000.	0.245E-02	0.582E-03	0.448E-03	0.474E-03	0.385E-03	0.394E-03
3s(3)S	300000.	0.213E-02	0.563E-03	0.519E-03	0.528E-03	0.440E-03	0.436E-03
	500000.	0.182E-02	0.526E-03	0.611E-03	0.601E-03	0.526E-03	0.492E-03
Ne III	20000.	0.666E-02	0.126E-03	0.394E-03	0.341E-04	*0.410E-03	*0.336E-04
251.3 Å	50000.	0.438E-02	0.209E-03	0.538E-03	0.655E-04	0.547E-03	0.640E-04
C=0.23E+20	100000.	0.334E-02	0.187E-03	0.610E-03	0.914E-04	0.617E-03	0.882E-04
2p(4)(3)P-	200000.	0.270E-02	0.210E-03	0.665E-03	0.111E-03	0.667E-03	0.107E-03
3d(3)D	300000.	0.244E-02	0.199E-03	0.682E-03	0.123E-03	0.683E-03	0.118E-03
	500000.	0.219E-02	0.188E-03	0.700E-03	0.140E-03	0.696E-03	0.134E-03
Ne III	20000.	1.06	-0.114E-01	0.218E-01	-0.503E-02	0.302E-01	-0.486E-02
2679.0 Å	50000.	0.688	-0.125E-01	0.404E-01	-0.114E-01	0.484E-01	-0.100E-01
C=0.27E+22	100000.	0.525	-0.172E-01	0.524E-01	-0.164E-01	0.561E-01	-0.142E-01
3s(3)S-	200000.	0.424	-0.158E-01	0.598E-01	-0.207E-01	0.630E-01	-0.173E-01
3p(3)P	300000.	0.382	-0.159E-01	0.643E-01	-0.232E-01	0.665E-01	-0.193E-01
	500000.	0.339	-0.152E-01	0.686E-01	-0.265E-01	0.688E-01	-0.217E-01
Ne III	20000.	0.964	-0.156E-02	*0.573E-01	-0.975E-03	*0.588E-01	-0.971E-03
2413.8 Å	50000.	0.636	-0.613E-03	*0.733E-01	-0.224E-02	*0.741E-01	-0.221E-02
C=0.21E+22	100000.	0.491	-0.282E-02	0.822E-01	-0.328E-02	*0.831E-01	-0.320E-02
3p(3)P-	200000.	0.404	-0.111E-02	0.875E-01	-0.421E-02	0.879E-01	-0.407E-02
3d(3)D	300000.	0.368	-0.149E-02	0.895E-01	-0.473E-02	0.898E-01	-0.456E-02
	500000.	0.333	-0.119E-02	0.913E-01	-0.536E-02	0.913E-01	-0.519E-02

PERTURBER DENSITY = 1.E+19 cm^{-3}

Ne III	20000.	9.15	-0.858E-01	0.155	-0.344E-01	*0.210	-0.327E-01
2593.1 Å	50000.	5.94	-0.101	0.320	-0.964E-01	*0.383	-0.837E-01
C=0.26E+23	100000.	4.50	-0.157	0.434	-0.147	*0.461	-0.126
3s(5)S-	200000.	3.61	-0.137	0.500	-0.192	0.523	-0.159
3p(5)P	300000.	3.24	-0.142	0.539	-0.218	0.554	-0.181
	500000.	2.88	-0.135	0.581	-0.249	0.580	-0.204
Ne III	20000.	7.12	-0.754E-02	*0.228	*0.489E-04	*0.276	*0.489E-04
2162.6 Å	50000.	4.69	-0.560E-03	0.424	0.171E-03	*0.470	*0.171E-03
C=0.17E+23	100000.	3.60	-0.449E-03	0.514	0.370E-03	*0.551	*0.369E-03
3p(5)P-	200000.	2.94	0.422E-02	0.581	0.749E-03	*0.616	*0.734E-03
3d(5)D	300000.	2.68	0.214E-02	0.616	0.109E-02	*0.635	*0.104E-02
	500000.	2.42	0.231E-02	0.640	0.160E-02	*0.656	*0.147E-02

Table 3. (continued)

PERTURBERS ARE:		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne III	20000.	0.738E-01	0.513E-02	0.353E-03	0.970E-03	0.478E-03	0.882E-03
313.4 Å	50000.	0.439E-01	0.543E-02	0.170E-02	0.244E-02	0.158E-02	0.209E-02
C=0.37E+21	100000.	0.318E-01	0.588E-02	0.304E-02	0.369E-02	0.289E-02	0.303E-02
2p(4)(3)P-	200000.	0.245E-01	0.564E-02	0.447E-02	0.464E-02	0.385E-02	0.383E-02
3s(3)S	300000.	0.213E-01	0.550E-02	0.519E-02	0.526E-02	0.440E-02	0.434E-02
	500000.	0.182E-01	0.519E-02	0.612E-02	0.599E-02	0.526E-02	0.491E-02
Ne III	20000.	0.666E-01	0.119E-02				
251.3 Å	50000.	0.438E-01	0.200E-02				
C=0.23E+21	100000.	0.334E-01	0.182E-02	*0.600E-02	*0.859E-03		
2p(4)(3)P-	200000.	0.270E-01	0.206E-02	*0.662E-02	*0.108E-02	*0.665E-02	*0.104E-02
3d(3)D	300000.	0.244E-01	0.195E-02	*0.681E-02	*0.122E-02	*0.682E-02	*0.118E-02
	500000.	0.219E-01	0.187E-02	*0.700E-02	*0.139E-02	*0.695E-02	*0.133E-02
Ne III	20000.	10.6	-0.940E-01	0.197	-0.365E-01	*0.262	-0.347E-01
2679.0 Å	50000.	6.88	-0.113	0.396	-0.102	*0.469	-0.889E-01
C=0.27E+23	100000.	5.25	-0.166	0.522	-0.156	*0.557	-0.134
3s(3)S-	200000.	4.24	-0.151	0.598	-0.204	0.629	-0.169
3p(3)P	300000.	3.82	-0.154	0.643	-0.231	0.664	-0.192
	500000.	3.39	-0.149	0.686	-0.265	0.688	-0.217
Ne III	20000.	9.64	-0.121E-01				
2413.8 Å	50000.	6.36	-0.418E-02				
C=0.21E+23	100000.	4.91	-0.266E-01				
3p(3)P-	200000.	4.04	-0.973E-02				
3d(3)D	300000.	3.68	-0.141E-01	*0.894	-0.471E-01		
	500000.	3.33	-0.115E-01	*0.912	-0.535E-01	*0.912	-0.517E-01
PERTURBER DENSITY = 1.E+20 cm^{-3}							
Ne III	20000.	*0.738	*0.289E-01	*0.277E-02	*0.263E-02	*0.337E-02	*0.180E-02
313.4 Å	50000.	0.439	0.431E-01	*0.167E-01	*0.164E-01	*0.154E-01	*0.129E-01
C=0.37E+22	100000.	0.318	0.514E-01	*0.304E-01	*0.300E-01	*0.288E-01	*0.232E-01
2p(4)(3)P-	200000.	0.245	0.512E-01	*0.449E-01	*0.415E-01	*0.387E-01	*0.336E-01
3s(3)S	300000.	0.213	0.506E-01	*0.519E-01	*0.499E-01	*0.439E-01	*0.407E-01
	500000.	0.182	0.482E-01	*0.611E-01	*0.595E-01	*0.526E-01	*0.487E-01
Ne III	20000.						
251.3 Å	50000.	0.438	0.170E-01				
C=0.23E+22	100000.	0.334	0.163E-01				
2p(4)(3)P-	200000.	0.270	0.192E-01				
3d(3)D	300000.	0.244	0.184E-01				
	500000.	0.219	0.177E-01				
PERTURBER DENSITY = 1.E+21 cm^{-3}							
Ne III	20000.						
313.4 Å	50000.						
C=0.37E+23	100000.	*3.14	*0.239				
2p(4)(3)P-	200000.	2.43	0.333				
3s(3)S	300000.	2.11	0.361				
	500000.	1.80	0.371				
Ne III	20000.						
251.3 Å	50000.						
C=0.23E+23	100000.	*3.31	0.946E-01				
2p(4)(3)P-	200000.	*2.69	0.146				
3d(3)D	300000.	2.43	0.149				
	500000.	2.18	0.148				

Table 4. This Table shows Mg II-, Si II-, and Fe II-impact broadening parameters for Ne III for perturber densities 10^{17}cm^{-3} - 10^{20}cm^{-3} and temperatures from 20,000 up to 500,000 K. Stark broadening parameters for densities lower than for tabulated values, are linear with perturber density.Transitions and averaged wavelengths for the multiplet (in Å) are also given in the Table. By dividing C by the corresponding full width at half maximum (Dimitrijević, Sahal-Bréchot and Bommier 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 the validity of the impact approximation lies between 0.1 and 0.5.

PERTURBER DENSITY = 1.E+17 cm^{-3}

PERTURBERS ARE:		IONIZED MAGNESIUM		IONIZED SILICON		IONIZED IRON	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne III	20000.	0.305E-02	-0.485E-03	0.308E-02	-0.483E-03	0.320E-02	-0.476E-03
2593.1 Å	50000.	0.434E-02	-0.860E-03	0.436E-02	-0.854E-03	0.441E-02	-0.838E-03
C=0.26E+21	100000.	0.493E-02	-0.114E-02	0.494E-02	-0.113E-02	0.500E-02	-0.109E-02
3s(5)S-	200000.	0.546E-02	-0.137E-02	0.547E-02	-0.136E-02	0.551E-02	-0.131E-02
3p(5)P	300000.	0.563E-02	-0.152E-02	0.566E-02	-0.151E-02	0.565E-02	-0.145E-02
	500000.	0.580E-02	-0.169E-02	0.583E-02	-0.167E-02	0.578E-02	-0.163E-02
Ne III	20000.	0.416E-02	0.738E-06	0.420E-02	0.738E-06	0.435E-02	0.738E-06
2162.6 Å	50000.	0.531E-02	0.191E-05	0.533E-02	0.191E-05	0.540E-02	0.191E-05
C=0.17E+21	100000.	0.593E-02	0.380E-05	0.595E-02	0.380E-05	0.602E-02	0.379E-05
3p(5)P-	200000.	0.636E-02	0.716E-05	0.637E-02	0.714E-05	0.640E-02	0.709E-05
3d(5)D	300000.	0.652E-02	0.965E-05	0.651E-02	0.962E-05	0.654E-02	0.949E-05
	500000.	0.666E-02	0.130E-04	0.667E-02	0.129E-04	0.667E-02	0.126E-04
Ne III	20000.	0.549E-05	0.133E-04	0.554E-05	0.132E-04	0.573E-05	0.131E-04
313.4 Å	50000.	0.156E-04	0.222E-04	0.155E-04	0.221E-04	0.156E-04	0.216E-04
C=0.37E+19	100000.	0.251E-04	0.277E-04	0.250E-04	0.275E-04	0.246E-04	0.266E-04
2p(4)(3)P-	200000.	0.329E-04	0.331E-04	0.326E-04	0.327E-04	0.316E-04	0.316E-04
3s(3)S	300000.	0.374E-04	0.365E-04	0.370E-04	0.362E-04	0.366E-04	0.348E-04
	500000.	0.444E-04	0.402E-04	0.429E-04	0.398E-04	0.414E-04	0.388E-04
Ne III	20000.	0.400E-04	0.382E-05	0.405E-04	0.381E-05	0.422E-04	0.376E-05
251.3 Å	50000.	0.539E-04	0.690E-05	0.541E-04	0.685E-05	0.550E-04	0.669E-05
C=0.23E+19	100000.	0.609E-04	0.937E-05	0.611E-04	0.927E-05	0.618E-04	0.895E-05
2p(4)(3)P-	200000.	0.663E-04	0.112E-04	0.665E-04	0.111E-04	0.667E-04	0.107E-04
3d(3)D	300000.	0.683E-04	0.125E-04	0.682E-04	0.123E-04	0.683E-04	0.119E-04
	500000.	0.700E-04	0.140E-04	0.700E-04	0.140E-04	0.696E-04	0.134E-04
Ne III	20000.	0.378E-02	-0.514E-03	0.382E-02	-0.512E-03	0.398E-02	-0.505E-03
2679.0 Å	50000.	0.525E-02	-0.912E-03	0.527E-02	-0.907E-03	0.535E-02	-0.889E-03
C=0.27E+21	100000.	0.595E-02	-0.121E-02	0.597E-02	-0.120E-02	0.605E-02	-0.116E-02
3s(3)S-	200000.	0.654E-02	-0.146E-02	0.657E-02	-0.145E-02	0.659E-02	-0.139E-02
3p(3)P	300000.	0.677E-02	-0.162E-02	0.674E-02	-0.160E-02	0.677E-02	-0.154E-02
	500000.	0.696E-02	-0.179E-02	0.696E-02	-0.178E-02	0.691E-02	-0.172E-02
Ne III	20000.	0.587E-02	-0.108E-03	0.593E-02	-0.108E-03	0.611E-02	-0.108E-03
2413.8 Å	50000.	0.735E-02	-0.233E-03	0.738E-02	-0.232E-03	0.747E-02	-0.228E-03
C=0.21E+21	100000.	0.820E-02	-0.334E-03	0.824E-02	-0.332E-03	0.832E-02	-0.323E-03
3p(3)P-	200000.	0.875E-02	-0.426E-03	0.876E-02	-0.421E-03	0.879E-02	-0.407E-03
3d(3)D	300000.	0.894E-02	-0.477E-03	0.895E-02	-0.473E-03	0.898E-02	-0.457E-03
	500000.	0.909E-02	-0.543E-03	0.913E-02	-0.536E-03	0.913E-02	-0.519E-03

PERTURBER DENSITY = 1.E+18 cm^{-3}

Ne III	20000.	0.298E-01	-0.433E-02	0.301E-01	-0.431E-02	0.312E-01	-0.424E-02
2593.1 Å	50000.	0.433E-01	-0.822E-02	0.434E-01	-0.817E-02	0.439E-01	-0.800E-02
C=0.26E+22	100000.	0.493E-01	-0.113E-01	0.494E-01	-0.111E-01	0.499E-01	-0.107E-01
3s(5)S-	200000.	0.546E-01	-0.137E-01	0.547E-01	-0.136E-01	0.550E-01	-0.131E-01
3p(5)P	300000.	0.563E-01	-0.152E-01	0.566E-01	-0.151E-01	0.565E-01	-0.145E-01
	500000.	0.580E-01	-0.169E-01	0.583E-01	-0.167E-01	0.578E-01	-0.163E-01
Ne III	20000.	*0.403E-01	*0.668E-05	*0.407E-01	*0.668E-05	*0.420E-01	*0.668E-05
2162.6 Å	50000.	*0.527E-01	*0.186E-04	*0.530E-01	*0.186E-04	*0.536E-01	*0.186E-04
C=0.17E+22	100000.	0.592E-01	0.378E-04	0.594E-01	0.378E-04	0.601E-01	0.377E-04
3p(5)P-	200000.	0.636E-01	0.715E-04	0.637E-01	0.714E-04	0.640E-01	0.708E-04
3d(5)D	300000.	0.652E-01	0.965E-04	0.651E-01	0.961E-04	0.654E-01	0.949E-04
	500000.	0.666E-01	0.130E-03	0.667E-01	0.129E-03	0.667E-01	0.126E-03

Table 4. (continued)

PERTURBERS ARE: TRANSITION	T(K)	IONIZED MAGNESIUM WIDTH (Å)	IONIZED MAGNESIUM SHIFT (Å)	IONIZED SILICON WIDTH (Å)	IONIZED SILICON SHIFT (Å)	IONIZED IRON WIDTH (Å)	IONIZED IRON SHIFT (Å)
Ne III	20000.	0.550E-04	0.117E-03	0.555E-04	0.117E-03	0.574E-04	0.115E-03
313.4 Å	50000.	0.155E-03	0.211E-03	0.155E-03	0.210E-03	0.156E-03	0.204E-03
C=0.37E+20	100000.	0.252E-03	0.272E-03	0.250E-03	0.270E-03	0.246E-03	0.261E-03
2p(4)(3)P-	200000.	0.329E-03	0.330E-03	0.326E-03	0.326E-03	0.316E-03	0.315E-03
3s(3)S	300000.	0.374E-03	0.364E-03	0.370E-03	0.361E-03	0.366E-03	0.347E-03
	500000.	0.444E-03	0.402E-03	0.429E-03	0.398E-03	0.414E-03	0.388E-03
Ne III	20000.	0.389E-03	0.342E-04	0.394E-03	0.341E-04	*0.410E-03	*0.336E-04
251.3 Å	50000.	0.536E-03	0.660E-04	0.538E-03	0.655E-04	0.547E-03	0.640E-04
C=0.23E+20	100000.	0.608E-03	0.924E-04	0.610E-03	0.914E-04	0.617E-03	0.882E-04
2p(4)(3)P-	200000.	0.662E-03	0.112E-03	0.665E-03	0.111E-03	0.667E-03	0.107E-03
3d(3)D	300000.	0.682E-03	0.125E-03	0.682E-03	0.123E-03	0.683E-03	0.118E-03
	500000.	0.700E-03	0.140E-03	0.700E-03	0.140E-03	0.696E-03	0.134E-03
Ne III	20000.	0.369E-01	-0.459E-02	0.373E-01	-0.457E-02	0.387E-01	-0.450E-02
2679.0 Å	50000.	0.523E-01	-0.873E-02	0.525E-01	-0.867E-02	0.532E-01	-0.849E-02
C=0.27E+22	100000.	0.594E-01	-0.120E-01	0.596E-01	-0.118E-01	0.604E-01	-0.114E-01
3s(3)S-	200000.	0.654E-01	-0.145E-01	0.657E-01	-0.144E-01	0.659E-01	-0.139E-01
3p(3)P	300000.	0.677E-01	-0.161E-01	0.674E-01	-0.160E-01	0.677E-01	-0.154E-01
	500000.	0.696E-01	-0.179E-01	0.696E-01	-0.178E-01	0.691E-01	-0.172E-01
Ne III	20000.	*0.568E-01	-0.976E-03	*0.573E-01	-0.975E-03	*0.588E-01	-0.971E-03
2413.8 Å	50000.	*0.731E-01	-0.225E-02	*0.733E-01	-0.224E-02	*0.741E-01	-0.221E-02
C=0.21E+22	100000.	0.819E-01	-0.331E-02	0.822E-01	-0.328E-02	*0.831E-01	-0.320E-02
3p(3)P-	200000.	0.875E-01	-0.425E-02	0.875E-01	-0.421E-02	0.879E-01	-0.407E-02
3d(3)D	300000.	0.894E-01	-0.476E-02	0.895E-01	-0.473E-02	0.898E-01	-0.456E-02
	500000.	0.909E-01	-0.543E-02	0.913E-01	-0.536E-02	0.913E-01	-0.519E-02
PERTURBER DENSITY = 1.E+19 cm^{-3}							
Ne III	20000.						
2593.1 Å	50000.						
C=0.26E+23	100000.	*0.488	-0.105	*0.489	-0.104	*0.494	-0.100
3s(5)S-	200000.	*0.544	-0.133	*0.545	-0.132	*0.548	-0.127
3p(5)P	300000.	*0.563	-0.152	*0.565	-0.150	*0.564	-0.145
	500000.	*0.580	-0.168	*0.583	-0.167	*0.578	-0.162
Ne III	20000.						
2162.6 Å	50000.						
C=0.17E+23	100000.						
3p(5)P-	200000.	*0.631	*0.711E-03	*0.634	*0.709E-03		
3d(5)D	300000.	*0.652	*0.964E-03	*0.650	*0.960E-03	*0.653	*0.948E-03
	500000.	*0.665	*0.130E-02	*0.667	*0.129E-02	*0.667	*0.126E-02
Ne III	20000.	0.541E-03	0.781E-03	0.545E-03	0.776E-03	0.563E-03	0.758E-03
313.4 Å	50000.	0.156E-02	0.179E-02	0.155E-02	0.177E-02	0.155E-02	0.172E-02
C=0.37E+21	100000.	0.250E-02	0.249E-02	0.249E-02	0.249E-02	0.245E-02	0.238E-02
2p(4)(3)P-	200000.	0.329E-02	0.320E-02	0.327E-02	0.315E-02	0.317E-02	0.304E-02
3s(3)S	300000.	0.374E-02	0.362E-02	0.370E-02	0.360E-02	0.366E-02	0.345E-02
	500000.	0.444E-02	0.400E-02	0.429E-02	0.396E-02	0.414E-02	0.386E-02
Ne III	20000.						
251.3 Å	50000.						
C=0.23E+21	100000.	*0.600E-02	*0.868E-03	*0.600E-02	*0.859E-03		
2p(4)(3)P-	200000.	*0.661E-02	*0.109E-02	*0.662E-02	*0.108E-02	*0.665E-02	*0.104E-02
3d(3)D	300000.	*0.682E-02	*0.124E-02	*0.681E-02	*0.122E-02	*0.682E-02	*0.118E-02
	500000.	*0.699E-02	*0.139E-02	*0.700E-02	*0.139E-02	*0.695E-02	*0.133E-02
Ne III	20000.						
2679.0 Å	50000.						
C=0.27E+23	100000.	*0.586	-0.112	*0.589	-0.111	*0.594	-0.106
3s(3)S-	200000.	*0.652	-0.141	*0.654	-0.140	*0.656	-0.135
3p(3)P	300000.	*0.676	-0.161	*0.674	-0.160	*0.676	-0.153
	500000.	*0.695	-0.179	*0.696	-0.177	*0.691	-0.172

Table 4. (continued)

PERTURBERS ARE:		IONIZED MAGNESIUM		IONIZED SILICON		IONIZED IRON	
TRANSITION	T(K)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)	WIDTH (Å)	SHIFT (Å)
Ne III	20000.						
2413.8 Å	50000.						
C=0.21E+23	100000.						
3p(3)P-	200000.						
3d(3)D	300000.	*0.893	-0.475E-01	*0.894	-0.471E-01		
	500000.	*0.908	-0.542E-01	*0.912	-0.535E-01	*0.912	-0.517E-01
PERTURBER DENSITY = 1.E+20 cm^{-3}							
Ne III	20000.						
313.4 Å	50000.						
C=0.37E+22	100000.						
2p(4)(3)P-	200000.						
3s(3)S	300000.						
	500000.	*0.444E-01	*0.396E-01	*0.429E-01	*0.392E-01		

calculations, not found in Moore (1971) and Bashkin and Stoner (1978) (or revised later) have been taken from Quinet, Palmeri and Biémont (1994) for Ne II and from Persson, Wahlström and Jönsson (1991) for Ne III. Corresponding ionization potential for Ne III has been taken also from Persson, Wahlström and Jönsson (1991). The results for 10 Ne II multiplets, for Stark broadening due to electron-, proton-, and ionized helium-impacts are shown in Table 1 for perturber densities $10^{15}cm^{-3}$ - $10^{20}cm^{-3}$ and temperatures from 5,000 up to 100,000 K. Electron-impact widths for the electron density of $10^{15}cm^{-3}$ are from Milosavljević, Dimitrijević and Djeniže (2001) and electron-impact shifts for the same electron density from Djeniže, Milosavljević and Dimitrijević (2001). In Table 2 are data for Stark broadening due to ionized magnesium-, ionized silicon-, and ionized iron-impacts for perturber densities $10^{17}cm^{-3}$ - 10^{19} cm^{-3}. The results for 6 Ne III multiplets, for Stark broadening due to electron-, proton-, and ionized helium-impacts are shown in Table 3 for perturber densities $10^{18}cm^{-3}$ - $10^{21}cm^{-3}$ and temperatures: 20,000 K; 50,000 K; 100,000 K; 200,000 K; 300,000 K and 500,000 K. In Table 4 are data for Stark broadening due to ionized magnesium-, ionized silicon-, and ionized iron-impacts. Data for electron-, proton- and ionized helium-impact broadening parameters for Ne II and Ne III spectral lines, for a perturber density of $10^{17}cm^{-3}$, not existing in Tables 1 and 3 will be published in Dimitrijević (2002). Stark broadening parameters for densities lower than for tabulated values, are linear with perturber density. We also specify a parameter C (Dimitrijević and Sahal-Bréchot 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 corresponding full width at half maximum. For each value given in Tables 1 - 4, the collision volume (V) multiplied by the perturber density (N) is much less than one and the impact approximation is valid (Sahal-Bréchot, 1969ab). Values for NV > 0.5 are not given and values for $0.1 <$ NV ≤ 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-Bréchot 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, Cooper and Smith (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.

The comparison of obtained results with experimental data for Ne II widths of Platiša, Dimitrijević and Konjević (1978); Pittman and Konjević (1986); Purić, Srećković, Labat and Ćirković (1987), Uzelac, Glenzer, Konjević, Hey and Kunze (1993), Blagojević, Popović and Konjević (1999) and del Val, Aparicio and Mar (2000), and with experimental data for Ne III of Konjević and Pittman (1987); Purić, Djeniže, Srećković, Ćuk, Labat and Platiša (1988); Uzelac, Glenzer, Konjević, Hey and Kunze (1993), Blagojević, Popović and Konjević (2000) is given in Milosavljević, Dimitrijević and Djeniže (2001), as well as the comparison with calculations of Ne II widths of Griem (1974); Uzelac, Glenzer, Konjević, Hey and Kunze (1993), and Ne III widths of Dimitrijević and Konjević (1981). The comparison with experimental data for Ne II shifts of Purić, Srećković, Labat and Ćirković (1987), and with calculations of Griem (1974), is given in Djeniže, Milosavljević and Dimitrijević (2001). The discussion of obtained results is also given in Dimitrijević (2002).

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ТАБЕЛЕ ПАРАМЕТАРА ШТАРКОВОГ ШИРЕЊА СПЕКТРАЛНИХ ЛИНИЈА Ne II И Ne III

М. С. Димитријевић

Астрономска опсерваторија, Волгина 7, 11160 Београд-74, Србија, Југославија

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Користећи семикласичан прилаз, израчунате су ширине и помераји спектралних линија, проузроковани сударима са електронима, протонима, као и јонима хелијума, магнезијума, силицијума и гвожђа за 10 мултиплета Ne II и 6 мултиплета Ne III. Резултати су дати у функцији температуре и концентрације пертурбера.