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Preliminary report

STARK BROADENING PARAMETER TABLES FOR LARGE QUANTUM NUMBER C IV UV LINES OF INTEREST FOR EXTREME ULTRAVIOLET EXPLORER MISSION

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SUMMARY: Using a semiclassical approach, we have calculated electron-, proton-, and ionized helium–impact line widths and shifts for 20 large principal quantum number C IV UV multiplets as a function of temperature for perturber densities 10^{16}-10^{19}cm^{-3}.

1. INTRODUCTION

We have recently calculated, Stark broadening data for 108 C IV multiplets (Dimitrijević and Sahal-Bréchot 1991ab, 1992). However, in the case of far ultraviolet multiplets with large principal quantum number, only data for perturber density 10^{15}cm^{-3} have been provided (Dimitrijević and Sahal-Bréchot 1992, Table 2) . Stark broadening data in the far and extreme ultraviolet, for lines originating from transitions between energy levels with large principal quantum number and low lying levels will become important for astrophysics in the near future. The Extreme Ultraviolet Explorer (EUVE) mission will provide the all sky survey in the λ =70 - 700 Å range by four EUV telescopes in Earth orbit (Bowyer and Malina 1991). Since due to Debye screening Stark broadening data are not linear with density for higher densities, the principal aim of this paper is to complement available C IV Stark broadening data (Dimitrijević and Sahal-Bréchot 1992, Table 2) with the higher density values.

2. RESULTS AND DISCUSSION

By using the semiclassical-perturbation formalism (Sahal-Bréchot 1969ab), we have calculated electron-, proton-, and ionized helium-impact line widths and shifts for 20 large principal quantum number C IV UV multiplets . A summary of the formalism is given in Dimitrijević and Sahal-Bréchot (1991a), and analysis in Dimitrijević and Sahal-Bréchot (1992).

Energy levels for C IV lines have been taken from Bashkin and Stoner (1975). Oscillator strengths have been calculated by using the method of Bates and Damgaard (1949) and the tables of Oertel and Shomo (1968). For higher levels, the method

Table 1. This table shows electron-, proton-, and ionized- helium- impact broadening parameters for C IV UV lines of large principal quantum number, for perturber densities of 10^{17} - 10^{18} cm and temperatures from 20,000 to 200,000 K. Transitions and averaged wavelengths for the multiplet (in Å) are also given. By using c [see Eq. (5) in Dimitrijeviq et al, 1991a], 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+17(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
CIV 2S-6P	20000.	0.111E-02	0.956E-04	0.140E-03	0.129E-03	0.128E-03	0.108E-03
212.4 A	50000.	0.923E-03	0.924E-04	0.186E-03	0.169E-03	0.166E-03	0.139E-03
C= 0.27E+16	100000.	0.796E-03	0.768E-04	0.227E-03	0.193E-03	0.189E-03	0.160E-03
	200000.	0.672E-03	0.581E-04	0.270E-03	0.224E-03	0.218E-03	0.184E-03
CIV 2S-7P	20000.	0.193E-02	0.192E-03	*0.304E-03	*0.269E-03	*0.266E-03	*0.224E-03
206.6 A	50000.	0.166E-02	0.185E-03	*0.403E-03	*0.351E-03	*0.344E-03	*0.285E-03
C= 0.15E+16	100000.	0.145E-02	0.141E-03	0.453E-03	0.378E-03	*0.408E-03	*0.333E-03
	200000.	0.124E-02	0.112E-03	0.494E-03	0.445E-03	*0.479E-03	*0.366E-03
C IV 2P-6S	20000.	0.938E-03	0.336E-03	0.104E-03	0.113E-03	0.904E-04	0.949E-04
247.4 A	50000.	0.787E-03	0.258E-03	0.148E-03	0.147E-03	0.123E-03	0.123E-03
C= 0.12E+17	100000.	0.682E-03	0.212E-03	0.188E-03	0.175E-03	0.158E-03	0.142E-03
	200000.	0.582E-03	0.175E-03	0.223E-03	0.187E-03	0.188E-03	0.165E-03
C IV 2P-7S	20000.	0.159E-02	0.674E-03	0.223E-03	0.227E-03	*0.192E-03	*0.191E-03
239.1 A	50000.	0.138E-02	0.501E-03	0.313E-03	0.298E-03	0.258E-03	0.249E-03
C= 0.71E+16	100000.	0.123E-02	0.410E-03	0.372E-03	0.334E-03	0.336E-03	0.271E-03
	200000.	0.107E-02	0.320E-03	0.428E-03	0.386E-03	0.347E-03	0.307E-03
C IV 2P-8S	20000.	0.259E-02	0.117E-02	*0.432E-03	*0.423E-03	*0.371E-03	*0.344E-03
234.1 A	50000.	0.232E-02	0.883E-03	*0.565E-03	*0.534E-03	*0.478E-03	*0.447E-03
C= 0.45E+16	100000.	0.210E-02	0.715E-03	*0.649E-03	*0.616E-03	*0.564E-03	*0.483E-03
	200000.	0.184E-02	0.543E-03	0.816E-03	0.713E-03	*0.623E-03	*0.537E-03
C IV 2P-9S	20000.	0.408E-02	0.192E-02	*0.772E-03	*0.715E-03		
230.9 A	50000.	0.373E-02	0.149E-02	*0.996E-03	*0.907E-03		
C= 0.31E+16	100000.	0.342E-02	0.116E-02	*0.117E-02	*0.104E-02	*0.935E-03	*0.854E-03
	200000.	0.300E-02	0.878E-03	*0.126E-02	*0.116E-02	*0.123E-02	*0.104E-02
CIV 2P-6D	20000.	0.241E-02	0.713E-04				
245.8 A	50000.	0.187E-02	0.918E-04				
C= 0.19E+15	100000.	0.153E-02	0.695E-04	*0.188E-02	*0.162E-02		
	200000.	0.123E-02	0.390E-04	*0.218E-02	*0.205E-02		
CIV 2P-7D	20000.	0.421E-02	0.112E-03				
238.2 A	50000.	0.332E-02	0.162E-03				
C= 0.17E+15	100000.	0.274E-02	0.124E-03				
	200000.	0.221E-02	0.671E-04				
CIV 3S-6P	20000.	0.900E-02	0.724E-03	0.110E-02	0.101E-02	0.100E-02	0.847E-03
595.5 A	50000.	0.744E-02	0.699E-03	0.146E-02	0.133E-02	0.130E-02	0.109E-02
C= 0.21E+17	100000.	0.640E-02	0.572E-03	0.178E-02	0.151E-02	0.149E-02	0.125E-02
	200000.	0.540E-02	0.428E-03	0.213E-02	0.176E-02	0.170E-02	0.144E-02
CIV 3S-7P	20000.	0.140E-01	0.134E-02	*0.217E-02	*0.192E-02	*0.190E-02	*0.160E-02
552.2 A	50000.	0.120E-01	0.130E-02	*0.288E-02	*0.251E-02	*0.246E-02	*0.203E-02
C= 0.11E+17	100000.	0.105E-01	0.981E-03	0.325E-02	0.269E-02	*0.291E-02	*0.237E-02
	200000.	0.893E-02	0.773E-03	0.353E-02	0.318E-02	*0.342E-02	*0.261E-02

PERTURBER DENSITY = 0.1D+17(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
C IV 3P-6S	20000.	0.730E-02	0.244E-02	0.760E-03	0.827E-03	0.664E-03	0.696E-03
672.4 A	50000.	0.611E-02	0.186E-02	0.109E-02	0.108E-02	0.912E-03	0.900E-03
C= 0.90E+17	100000.	0.530E-02	0.154E-02	0.137E-02	0.129E-02	0.117E-02	0.104E-02
	200000.	0.453E-02	0.127E-02	0.167E-02	0.137E-02	0.138E-02	0.121E-02
C IV 3P-7S	20000.	0.108E-01	0.441E-02	0.147E-02	0.150E-02	*0.126E-02	*0.126E-02
614.9 A	50000.	0.939E-02	0.328E-02	0.206E-02	0.197E-02	0.170E-02	0.164E-02
C= 0.47E+17	100000.	0.837E-02	0.269E-02	0.245E-02	0.221E-02	0.222E-02	0.179E-02
	200000.	0.725E-02	0.210E-02	0.282E-02	0.255E-02	0.230E-02	0.203E-02
C IV 3P-8S	20000.	0.164E-01	0.724E-02	*0.267E-02	*0.262E-02	*0.230E-02	*0.213E-02
582.8 A	50000.	0.146E-01	0.545E-02	*0.350E-02	*0.331E-02	*0.296E-02	*0.277E-02
C= 0.28E+17	100000.	0.132E-01	0.441E-02	0.401E-02	0.382E-02	*0.350E-02	*0.299E-02
	200000.	0.116E-01	0.335E-02	0.506E-02	0.442E-02	*0.385E-02	*0.333E-02
C IV 3P-9S	20000.	0.245E-01	0.114E-01	*0.459E-02	*0.425E-02		
562.9 A	50000.	0.224E-01	0.883E-02	*0.592E-02	*0.539E-02		
C= 0.18E+17	100000.	0.205E-01	0.686E-02	*0.698E-02	*0.619E-02	*0.555E-02	*0.507E-02
	200000.	0.180E-01	0.520E-02	*0.745E-02	*0.687E-02	*0.730E-02	*0.617E-02
CIV 3P-6D	20000.	0.178E-01	0.500E-03				
660.9 A	50000.	0.138E-01	0.639E-03				
C= 0.14E+16	100000.	0.113E-01	0.483E-03	*0.136E-01	*0.117E-01		
	200000.	0.905E-02	0.263E-03	*0.157E-01	*0.148E-01		
CIV 3P-7D	20000.	0.278E-01	0.720E-03				
608.9 A	50000.	0.219E-01	0.103E-02				
C= 0.11E+16	100000.	0.180E-01	0.794E-03				
	200000.	0.146E-01	0.422E-03				
CIV 3D-6P	20000.	0.117E-01	0.101E-02	0.145E-02	0.135E-02	0.132E-02	0.113E-02
685.4 A	50000.	0.971E-02	0.975E-03	0.194E-02	0.177E-02	0.172E-02	0.145E-02
C= 0.28E+17	100000.	0.837E-02	0.810E-03	0.235E-02	0.201E-02	0.196E-02	0.166E-02
	200000.	0.706E-02	0.615E-03	0.281E-02	0.234E-02	0.227E-02	0.192E-02
CIV 3D-7P	20000.	0.180E-01	0.179E-02	*0.282E-02	*0.249E-02	*0.246E-02	*0.208E-02
628.7 A	50000.	0.154E-01	0.172E-02	*0.373E-02	*0.326E-02	*0.318E-02	*0.264E-02
C= 0.14E+17	100000.	0.135E-01	0.132E-02	0.418E-02	0.350E-02	*0.378E-02	*0.309E-02
	200000.	0.115E-01	0.104E-02	0.456E-02	0.412E-02	*0.443E-02	*0.339E-02
CIV 3D-6F	20000.	0.186E-01	-0.228E-03				
682.5 A	50000.	0.148E-01	-0.215E-03				
C= 0.14E+15	100000.	0.120E-01	-0.201E-03				
	200000.	0.957E-02	-0.160E-03				
CIV 3D-7F	20000.	0.309E-01	-0.516E-03				
627.1 A	50000.	0.246E-01	-0.545E-03				
C= 0.76E+14	100000.	0.201E-01	-0.454E-03				
	200000.	0.160E-01	-0.310E-03				

PERTURBER DENSITY = 0.1D+18(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
CIV 2S-6P	20000.	0.111E-01	0.706E-03	*0.139E-02	*0.107E-02		
212.4 A	50000.	0.923E-02	0.838E-03	*0.186E-02	*0.160E-02		
C= 0.27E+17	100000.	0.796E-02	0.751E-03	*0.227E-02	*0.191E-02		
	200000.	0.672E-02	0.581E-03	*0.270E-02	*0.224E-02	*0.218E-02	*0.184E-02
CIV 2S-7P	20000.	0.192E-01	0.114E-02				
206.6 A	50000.	0.165E-01	0.159E-02				
C= 0.15E+17	100000.	0.145E-01	0.137E-02				
	200000.	0.123E-01	0.112E-02				
C IV 2P-6S	20000.	0.938E-02	0.320E-02	*0.103E-02	*0.965E-03	*0.902E-03	*0.786E-03
247.4 A	50000.	0.786E-02	0.252E-02	*0.147E-02	*0.141E-02	*0.125E-02	*0.117E-02
C= 0.12E+18	100000.	0.682E-02	0.211E-02	*0.188E-02	*0.174E-02	*0.158E-02	*0.140E-02
	200000.	0.582E-02	0.174E-02	*0.223E-02	*0.187E-02	*0.188E-02	*0.165E-02
C IV 2P-7S	20000.	0.159E-01	0.626E-02				
239.1 A	50000.	0.138E-01	0.485E-02				
C= 0.71E+17	100000.	0.123E-01	0.408E-02	*0.372E-02	*0.331E-02		
	200000.	0.107E-01	0.318E-02	*0.428E-02	*0.386E-02		
C IV 2P-8S	20000.	0.259E-01	0.107E-01				
234.1 A	50000.	0.232E-01	0.841E-02				
C= 0.45E+17	100000.	0.210E-01	0.709E-02				
	200000.	0.184E-01	0.537E-02				
C IV 2P-9S	20000.	0.407E-01	0.168E-01				
230.9 A	50000.	0.372E-01	0.139E-01				
C= 0.31E+17	100000.	0.342E-01	0.115E-01				
	200000.	0.300E-01	0.865E-02				
CIV 2P-6D	20000.	0.202E-01	-0.773E-03				
245.8 A	50000.	0.163E-01	-0.326E-04				
C= 0.19E+16	100000.	0.136E-01	0.402E-03				
	200000.	0.111E-01	0.390E-03				
CIV 2P-7D	20000.	0.344E-01	-0.138E-02				
238.2 A	50000.	0.285E-01	-0.108E-03				
C= 0.17E+16	100000.	0.240E-01	0.686E-03				
	200000.	0.198E-01	0.671E-03				
CIV 3S-6P	20000.	0.900E-01	0.530E-02	*0.109E-01	*0.840E-02		
595.5 A	50000.	0.744E-01	0.632E-02	*0.146E-01	*0.125E-01		
C= 0.21E+18	100000.	0.640E-01	0.559E-02	*0.178E-01	*0.150E-01		
	200000.	0.540E-01	0.428E-02	*0.213E-01	*0.176E-01	*0.170E-01	*0.144E-01
CIV 3S-7P	20000.	0.139	0.783E-02				
552.2 A	50000.	0.120	0.111E-01				
C= 0.11E+18	100000.	0.105	0.948E-02				
	200000.	0.890E-01	0.773E-02				

PERTURBER DENSITY = 0.1D+18(cm-3)

		PERTURBERS ARE	ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION		T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
C IV 3P-6S		20000.	0.731E-01	0.232E-01	*0.756E-02	*0.709E-02	*0.663E-02	*0.577E-02
672.4 A		50000.	0.611E-01	0.182E-01	*0.108E-01	*0.104E-01	*0.919E-02	*0.857E-02
C= 0.90E+18		100000.	0.530E-01	0.153E-01	*0.137E-01	*0.128E-01	*0.117E-01	*0.104E-01
		200000.	0.453E-01	0.126E-01	*0.167E-01	*0.137E-01	*0.138E-01	*0.121E-01
C IV 3P-7S		20000.	0.108	0.409E-01				
614.9 A		50000.	0.939E-01	0.317E-01				
C= 0.47E+18		100000.	0.837E-01	0.267E-01	*0.245E-01	*0.219E-01		
		200000.	0.725E-01	0.208E-01	*0.282E-01	*0.255E-01		
C IV 3P-8S		20000.	0.164	0.659E-01				
582.8 A		50000.	0.146	0.518E-01				
C= 0.28E+18		100000.	0.132	0.437E-01				
		200000.	0.116	0.331E-01				
C IV 3P-9S		20000.	0.245	0.995E-01				
562.9 A		50000.	0.223	0.826E-01				
C= 0.18E+18		100000.	0.205	0.679E-01				
		200000.	0.180	0.512E-01				
CIV 3P-6D		20000.	0.150	-0.570E-02				
660.9 A		50000.	0.120	-0.468E-03				
C= 0.14E+17		100000.	0.100	0.271E-02				
		200000.	0.818E-01	0.263E-02				
CIV 3P-7D		20000.	0.228	-0.912E-02				
608.9 A		50000.	0.188	-0.900E-03				
C= 0.11E+17		100000.	0.159	0.431E-02				
		200000.	0.131	0.422E-02				
CIV 3D-6P		20000.	0.117	0.748E-02	*0.144E-01	*0.112E-01		
685.4 A		50000.	0.971E-01	0.886E-02	*0.193E-01	*0.167E-01		
C= 0.28E+18		100000.	0.837E-01	0.793E-02	*0.235E-01	*0.200E-01		
		200000.	0.706E-01	0.615E-02	*0.281E-01	*0.234E-01	*0.227E-01	*0.192E-01
CIV 3D-7P		20000.	0.179	0.106E-01				
628.7 A		50000.	0.154	0.148E-01				
C= 0.14E+18		100000.	0.135	0.128E-01				
		200000.	0.115	0.104E-01				
CIV 3D-6F		20000.	0.138	0.118E-02				
682.5 A		50000.	0.117	-0.199E-02				
C= 0.14E+16		100000.	0.985E-01	-0.278E-02				
		200000.	0.805E-01	-0.160E-02				
CIV 3D-7F		20000.	0.223	0.176E-02				
627.1 A		50000.	0.190	-0.440E-02				
C= 0.76E+15		100000.	0.161	-0.640E-02				
		200000.	0.133	-0.310E-02				

PERTURBER DENSITY = 0.1D+19(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
CIV 2S-6P	20000.	0.106	0.267E-04				
212.4 A	50000.	0.893E-01	0.410E-02				
C= 0.27E+18	100000.	0.775E-01	0.543E-02				
	200000.	0.657E-01	0.542E-02				
CIV 2S-7P	20000.	0.168	-0.485E-02				
206.6 A	50000.	0.151	0.478E-02				
C= 0.15E+18	100000.	0.135	0.767E-02				
	200000.	0.116	0.998E-02				
C IV 2P-6S	20000.	0.937E-01	0.269E-01				
247.4 A	50000.	0.786E-01	0.222E-01				
C= 0.12E+19	100000.	0.682E-01	0.197E-01				
	200000.	0.582E-01	0.172E-01				
C IV 2P-7S	20000.	0.157	0.475E-01				
239.1 A	50000.	0.137	0.397E-01				
C= 0.71E+18	100000.	0.123	0.368E-01				
	200000.	0.106	0.312E-01				
C IV 2P-8S	20000.	*0.246	*0.697E-01				
234.1 A	50000.	0.224	0.625E-01				
C= 0.45E+18	100000.	0.205	0.607E-01				
	200000.	0.180	0.524E-01				
C IV 2P-9S	20000.	*0.353	*0.888E-01				
230.9 A	50000.	0.343	0.913E-01				
C= 0.31E+18	100000.	0.321	0.911E-01				
	200000.	0.286	0.834E-01				
CIV 2P-6D	20000.	0.151	-0.419E-02				
245.8 A	50000.	0.130	-0.343E-02				
C= 0.19E+17	100000.	0.112	-0.860E-03				
	200000.	0.944E-01	0.120E-02				
CIV 2P-7D	20000.	0.236	-0.351E-02				
238.2 A	50000.	0.215	-0.393E-02				
C= 0.17E+17	100000.	0.191	-0.445E-03				
	200000.	0.163	0.197E-02				
CIV 3S-6P	20000.	0.859	-0.221E-02				
595.5 A	50000.	0.720	0.296E-01				
C= 0.21E+19	100000.	0.624	0.395E-01				
	200000.	0.528	0.398E-01				
CIV 3S-7P	20000.	1.22	-0.374E-01				
552.2 A	50000.	1.10	0.317E-01				
C= 0.11E+19	100000.	0.977	0.520E-01				
	200000.	0.842	0.688E-01				

PERTURBER DENSITY = 0.1D+19(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
C IV 3P-6S	20000.	0.730	0.195				
672.4 A	50000.	0.610	0.161				
C= 0.90E+19	100000.	0.530	0.143				
	200000.	0.453	0.125				
C IV 3P-7S	20000.	1.07	0.310				
614.9 A	50000.	0.931	0.259				
C= 0.47E+19	100000.	0.832	0.241				
	200000.	0.721	0.205				
C IV 3P-8S	20000.	*1.55	*0.429				
582.8 A	50000.	1.41	0.384				
C= 0.28E+19	100000.	1.29	0.374				
	200000.	1.13	0.323				
C IV 3P-9S	20000.	*2.13	*0.525				
562.9 A	50000.	2.06	0.540				
C= 0.18E+19	100000.	1.93	0.540				
	200000.	1.71	0.494				
CIV 3P-6D	20000.	1.12	-0.312E-01				
660.9 A	50000.	0.965	-0.270E-01				
C= 0.14E+18	100000.	0.833	-0.810E-02				
	200000.	0.698	0.685E-02				
CIV 3P-7D	20000.	1.57	-0.238E-01				
608.9 A	50000.	1.43	-0.275E-01				
C= 0.11E+18	100000.	1.27	-0.453E-02				
	200000.	1.08	0.113E-01				
CIV 3D-6P	20000.	1.11	0.129E-02				
685.4 A	50000.	0.940	0.439E-01				
C= 0.28E+19	100000.	0.815	0.575E-01				
	200000.	0.691	0.574E-01				
CIV 3D-7P	20000.	1.56	-0.439E-01				
628.7 A	50000.	1.41	0.453E-01				
C= 0.14E+19	100000.	1.26	0.719E-01				
	200000.	1.08	0.932E-01				
CIV 3D-6F	20000.	0.906	0.269E-01				
682.5 A	50000.	0.844	0.700E-02				
C= 0.14E+17	100000.	0.748	-0.101E-01				
	200000.	0.635	-0.198E-01				
CIV 3D-7F	20000.	1.38	0.418E-01				
627.1 A	50000.	1.32	0.810E-02				
C= 0.76E+16	100000.	1.19	-0.236E-01				
	200000.	1.02	-0.410E-01				

PERTURBER DENSITY = 0.1D+20(cm-3)

PERTURBERS ARE		ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION	T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
CIV 2S-6P	20000.	*0.748	*-0.674E-01				
212.4 A	50000.	*0.707	*-0.188E-01				
C= 0.27E+19	100000.	0.649	-0.187E-02				
	200000.	0.570	0.202E-01				
CIV 2S-7P	20000.						
206.6 A	50000.	*1.02	*-0.291E-01				
C= 0.15E+19	100000.	*1.02	*-0.129E-01				
	200000.	0.931	0.324E-01				
C IV 2P-6S	20000.	*0.806	*0.881E-01				
247.4 A	50000.	0.728	0.114				
C= 0.12E+20	100000.	0.644	0.116				
	200000.	0.555	0.139				
C IV 2P-7S	20000.	*1.03	*0.700E-01				
239.1 A	50000.	1.11	0.139				
C= 0.71E+19	100000.	1.05	0.165				
	200000.	0.943	0.220				
C IV 2P-8S	20000.						
234.1 A	50000.	*1.47	*0.130				
C= 0.45E+19	100000.	1.55	0.195				
	200000.	1.45	0.317				
C IV 2P-9S	20000.						
230.9 A	50000.	*1.74	*0.121				
C= 0.31E+19	100000.	2.07	0.206				
	200000.	2.07	0.437				
CIV 2P-6D	20000.	*0.867	*0.532E-01				
245.8 A	50000.	0.867	0.124E-01				
C= 0.19E+18	100000.	0.813	0.164E-02				
	200000.	0.721	-0.648E-02				
CIV 2P-7D	20000.						
238.2 A	50000.	*1.26	*0.294E-01				
C= 0.17E+18	100000.	1.27	0.123E-01				
	200000.	1.17	-0.814E-02				
CIV 3S-6P	20000.	*6.16	*-0.549				
595.5 A	50000.	*5.74	*-0.170				
C= 0.21E+20	100000.	5.25	-0.433E-01				
	200000.	4.60	0.132				
CIV 3S-7P	20000.						
552.2 A	50000.	*7.48	*-0.229				
C= 0.11E+20	100000.	*7.38	*-0.118				
	200000.	6.75	0.207				

PERTURBER DENSITY = 0.1D+20(cm-3)

		PERTURBERS ARE	ELECTRONS		PROTONS		IONIZED HELIUM	
TRANSITION		T(K)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)	WIDTH(A)	SHIFT(A)
C IV 3P-6S		20000.	*6.33	*0.625				
672.4 A		50000.	5.68	0.814				
C= 0.90E+20		100000.	5.02	0.836				
		200000.	4.33	1.01				
C IV 3P-7S		20000.	*7.10	*0.432				
614.9 A		50000.	7.58	0.892				
C= 0.47E+20		100000.	7.18	1.07				
		200000.	6.43	1.44				
C IV 3P-8S		20000.						
582.8 A		50000.	*9.35	*0.787				
C= 0.28E+20		100000.	9.77	1.19				
		200000.	9.18	1.95				
C IV 3P-9S		20000.						
562.9 A		50000.	*10.5	*0.704				
C= 0.18E+20		100000.	12.5	1.21				
		200000.	12.5	2.58				
CIV 3P-6D		20000.	*6.61	*0.386				
660.9 A		50000.	6.51	0.744E-01				
C= 0.14E+19		100000.	6.07	-0.183E-02				
		200000.	5.37	-0.635E-01				
CIV 3P-7D		20000.						
608.9 A		50000.	*8.47	*0.179				
C= 0.11E+19		100000.	8.44	0.684E-01				
		200000.	7.78	-0.672E-01				
CIV 3D-6P		20000.	*7.92	*-0.701				
685.4 A		50000.	*7.46	*-0.189				
C= 0.28E+20		100000.	6.84	-0.132E-01				
		200000.	6.00	0.219				
CIV 3D-7P		20000.						
628.7 A		50000.	*9.57	*-0.263				
C= 0.14E+20		100000.	9.47	-0.114				
		200000.	8.67	0.307				
CIV 3D-6F		20000.	*5.18	*0.187				
682.5 A		50000.	5.41	0.144				
C= 0.14E+18		100000.	5.18	0.127				
		200000.	4.67	0.411E-01				
CIV 3D-7F		20000.						
627.1 A		50000.	*7.71	*0.211				
C= 0.76E+17		100000.	7.75	0.158				
		200000.	7.21	0.246E-01				

described by Van Regemorter et al. (1979) has been used. In addition to electron-impact full halfwidths and shifts, Stark-broadening parameters due to proton-, and ionized helium- impacts have been calculated.

Our results for C IV UV multiplets of large principal quantum number are shown in Table 1, for perturber densities 10^{16} - 10^{19} cm and temperatures T = 20,000 - 200,000 K. 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 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-Bréchot, 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 estimations (Sahal-Bréchot 1991 and Griem 1974). The accuracy of the results obtained decreases when broadening by ion interactions becomes important.

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ТАБЕЛЕ ПАРАМЕТАРА ШТАРКОВОГ ШИРЕЊА C IV UV МУЛТИПЛЕТА СА ВЕЛИКИМ ГЛАВНИМ КВАНТНИМ БРОЈЕМ ОД ЗНАЧАЈА ЗА EXTREME ULTRAVIOLET EXPLORER МИСИЈУ

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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 20 UV мултиплета са великим главним квантним бројем, троструко наелектрисаног јона угљеника. Резултати су дати у функцији температуре и концентрације пертурбера.