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Corrigendum

An *R*-matrix with pseudo-states approach to the electron-impact excitation of H I for diagnostic applications in fusion plasmas

H Anderson, C P Ballance, N R Badnell and H P Summers *J. Phys. B: At. Mol. Opt. Phys.* **33** 1255

It has been drawn to our attention (Dere and Mason 2002) that the high temperature ($\gtrsim 15$ eV) dipole effective collision strengths of Anderson *et al* (2000) do not approach the assumed asymptotic form. On investigation, we have found that the underlying collision strengths approach the assumed asymptotic form at high energies, but that the problem lies in their Maxwell averaging. A least squares fit was made to the high energy collision strengths, utilizing the infinite energy limit point. However, *R*-matrix with pseudo-states collision strengths exhibit shallow oscillatory behaviour at all energies, due to high-lying pseudo thresholds. Consequently, the least squares fit gave increasingly inaccurate results for the collision strengths at energies beyond the highest calculated energy and this in turn had an increasing effect on the high temperature Maxwell-averaged effective collision strengths. Using the original collision strengths of Anderson *et al* (2000), we have recomputed the dipole effective collision strengths, this time using a simple linear interpolation of reduced collision strengths between the highest finite energy and the infinite energy limit value. Results for the non-dipole transitions were originally computed by extrapolating the collision strengths as a constant and so were not subject to the inaccuracy inherent in the least-squares fitting. However, we can also improve the accuracy of the high temperature non-dipole effective collision strengths by making use of the infinite energy limit Born collision strength, which was not available to Anderson *et al* (2000). Again, we use a simple linear interpolation of the original Anderson *et al* (2000) collision strengths between the highest finite energy and the infinite energy limit Born value. The revised effective collision strengths are given in table 1 of this corrigendum and they replace the values in table 2 of Anderson *et al* (2000). The conclusions of the modelling carried out by Anderson *et al* (2000) are unaffected as this was primarily at temperatures below 15 eV, where the change in the effective collision strengths is $\lesssim 10\%$. The coronal fractional abundance of H at 15 eV is $< 10^{-5}$. The revised *adf04* data file for hydrogen is available from http://www-cfadc.phy.ornl.gov/data_and_codes/.

Acknowledgments

We would like to thank Ken Dere and Helen Mason for drawing our attention to the anomalous behaviour of the high temperature dipole effective collision strengths.

References

Anderson H, Ballance C P, Badnell N R and Summers H P 2000 *J. Phys. B: At. Mol. Opt. Phys.* **33** 1255–62

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Table 1. Effective collision strengths for the $nl \rightarrow n'l'$ transitions in H for $n, n' \in \{1, 2, 3, 4, 5\}$, $l, l' \in \{0, 1, 2, 3, 4\}$ and $n \neq n'$.

			Electron temperature (eV)							
i	j	A_{ij}^{a}	0.5	1.0	3.0	5.0	10.0	15.0	20.0	25.0
2	1	8.23+00[b]	2.60−01	2.96−01	3.26−01	3.39−01	3.73−01	4.06−01	4.36−01	4.61−01
3	1	6.27+08	4.29−01	5.29−01	8.53−01	1.15+00	1.81+00	2.35+00	2.81+00	3.20+00
4	1	0.00+00	6.51−02	6.96−02	7.76−02	8.13−02	8.70−02	9.21−02	9.66−02	1.01−01
5	1	1.67+08	1.12−01	1.26−01	1.86−01	2.43−01	3.54−01	4.38−01	5.07−01	5.66−01
6	1	0.00+00	6.21−02	6.58−02	7.82−02	8.97−02	1.09−01	1.20−01	1.26−01	1.30−01
7	1	0.00+00	2.23−02	2.55−02	3.19−02	3.40−02	3.61−02	3.76−02	3.90−02	4.02−02
8	1	6.82+07	4.03−02	4.79−02	7.40−02	9.46−02	1.33−01	1.61−01	1.84−01	2.04−01
9	1	0.00+00	3.00−02	3.19−02	4.04−02	4.72−02	5.69−02	6.15−02	6.41−02	6.56−02
10	1	0.00+00	1.23−02	1.14−02	1.05−02	1.05−02	1.06−02	1.04−02	1.01−02	9.80−03
11	1	0.00+00	1.45−02	1.72−02	1.92−02	1.93−02	1.94−02	1.97−02	2.02−02	2.07−02
12	1	3.44+07	2.69−02	3.15−02	4.04−02	4.77−02	6.34−02	7.59−02	8.65−02	9.57−02
13	1	0.00+00	2.08−02	2.22−02	2.47−02	2.75−02	3.13−02	3.30−02	3.39−02	3.44−02
14	1	0.00+00	9.19−03	9.14−03	9.52−03	9.92−03	1.03−02	1.02−02	9.96−03	9.66−03
15	1	0.00+00	4.66−03	4.03−03	2.85−03	2.35−03	1.76−03	1.47−03	1.29−03	1.15−03
4	2	0.00+00	1.38+00	1.45+00	2.28+00	3.09+00	4.50+00	5.40+00	6.03+00	6.50+00
5	2	2.25+07	2.46+00	3.05+00	5.28+00	7.74+00	1.35+01	1.84+01	2.24+01	2.58+01
6	2	0.00+00	2.09+00	3.08+00	6.56+00	9.38+00	1.42+01	1.72+01	1.93+01	2.08+01
7	2	0.00+00	3.92−01	3.88−01	5.08−01	6.38−01	8.80−01	1.04+00	1.16+00	1.25+00
8	2	9.67+06	7.70−01	9.03−01	1.45+00	1.95+00	3.01+00	3.85+00	4.54+00	5.13+00
9	2	0.00+00	6.54−01	7.54−01	1.12+00	1.41+00	1.93+00	2.25+00	2.48+00	2.65+00
10	2	0.00+00	5.65−01	7.38−01	1.29+00	1.62+00	2.04+00	2.21+00	2.30+00	2.34+00
11	2	0.00+00	2.01−01	2.13−01	2.33−01	2.64−01	3.37−01	3.92−01	4.34−01	4.66−01
12	2	4.95+06	4.20−01	5.18−01	7.14−01	8.68−01	1.21+00	1.49+00	1.73+00	1.93+00
13	2	0.00+00	4.35−01	4.87−01	5.56−01	6.09−01	7.18−01	7.96−01	8.55−01	9.01−01
14	2	0.00+00	3.91−01	4.61−01	6.76−01	8.14−01	9.77−01	1.04+00	1.07+00	1.09+00
15	2	0.00+00	2.35−01	2.54−01	2.52−01	2.47−01	2.36−01	2.24−01	2.14−01	2.05−01
4	3	6.32+06	2.04+00	2.22+00	2.28+00	2.35+00	2.68+00	3.02+00	3.34+00	3.62+00
5	3	0.00+00	7.26+00	7.92+00	1.07+01	1.33+01	1.77+01	2.04+01	2.23+01	2.37+01
6	3	6.47+07	1.32+01	1.78+01	3.69+01	5.58+01	9.44+01	1.23+02	1.46+02	1.65+02
7	3	2.58+06	7.36−01	7.71−01	7.58−01	7.42−01	7.51−01	7.84−01	8.21−01	8.57−01
8	3	0.00+00	2.16+00	2.26+00	2.69+00	3.08+00	3.77+00	4.21+00	4.53+00	4.76+00
9	3	2.06+07	3.54+00	4.31+00	7.62+00	1.06+01	1.63+01	2.04+01	2.34+01	2.60+01
10	3	0.00+00	2.72+00	3.21+00	4.93+00	6.09+00	7.62+00	8.33+00	8.72+00	8.95+00
11	3	1.29+06	4.63−01	5.10−01	4.75−01	4.38−01	4.03−01	3.97−01	4.01−01	4.07−01
12	3	0.00+00	1.32+00	1.40+00	1.37+00	1.40+00	1.53+00	1.65+00	1.74+00	1.81+00
13	3	9.43+06	2.07+00	2.48+00	3.44+00	4.27+00	5.90+00	7.08+00	8.01+00	8.77+00
14	3	0.00+00	1.71+00	2.02+00	2.90+00	3.47+00	4.17+00	4.46+00	4.60+00	4.68+00
15	3	0.00+00	8.44−01	9.09−01	9.15−01	8.88−01	8.14−01	7.51−01	7.01−01	6.61−01
7	4	0.00+00	2.62+00	4.31+00	1.08+01	1.54+01	2.22+01	2.62+01	2.88+01	3.07+01
8	4	3.07+06	4.50+00	5.95+00	1.52+01	2.57+01	4.88+01	6.71+01	8.21+01	9.46+01
9	4	0.00+00	6.41+00	1.01+01	2.29+01	3.24+01	4.72+01	5.56+01	6.12+01	6.51+01
10	4	0.00+00	6.84+00	1.06+01	1.96+01	2.48+01	3.17+01	3.53+01	3.75+01	3.90+01
11	4	0.00+00	1.04+00	1.59+00	2.91+00	3.58+00	4.53+00	5.10+00	5.50+00	5.80+00
12	4	1.64+06	2.61+00	3.46+00	5.57+00	7.36+00	1.12+01	1.42+01	1.67+01	1.87+01
13	4	0.00+00	3.38+00	4.26+00	6.14+00	7.14+00	8.66+00	9.61+00	1.03+01	1.08+01
14	4	0.00+00	2.94+00	3.41+00	4.12+00	4.45+00	4.73+00	4.79+00	4.78+00	4.76+00
15	4	0.00+00	3.77+00	4.82+00	6.71+00	7.83+00	9.16+00	9.67+00	9.89+00	9.99+00

Table 1. (Continued)

			Electron temperature (eV)							
i	j	A_{ij}[a]	0.5	1.0	3.0	5.0	10.0	15.0	20.0	25.0
7	5	1.84+06	4.07+00	4.88+00	7.63+00	9.79+00	1.41+01	1.75+01	2.03+01	2.27+01
8	5	0.00+00	1.41+01	2.07+01	4.49+01	6.19+01	8.70+01	1.01+02	1.10+02	1.16+02
9	5	7.04+06	2.13+01	3.13+01	8.24+01	1.34+02	2.38+02	3.17+02	3.79+02	4.30+02
10	5	0.00+00	2.54+01	4.09+01	8.79+01	1.19+02	1.67+02	1.94+02	2.12+02	2.24+02
11	5	9.05+05	2.25+00	2.58+00	3.01+00	3.24+00	3.77+00	4.22+00	4.62+00	4.96+00
12	5	0.00+00	7.47+00	9.77+00	1.40+01	1.59+01	1.88+01	2.06+01	2.18+01	2.27+01
13	5	3.39+06	1.15+01	1.53+01	2.67+01	3.56+01	5.21+01	6.41+01	7.36+01	8.13+01
14	5	0.00+00	1.04+01	1.25+01	1.65+01	1.83+01	2.04+01	2.14+01	2.20+01	2.24+01
15	5	0.00+00	1.47+01	1.86+01	2.47+01	2.86+01	3.36+01	3.57+01	3.67+01	3.72+01
7	6	0.00+00	4.21+00	4.27+00	4.35+00	4.56+00	4.93+00	5.12+00	5.23+00	5.29+00
8	6	3.48+05	1.37+01	1.55+01	1.97+01	2.19+01	2.52+01	2.74+01	2.91+01	3.05+01
9	6	0.00+00	3.44+01	4.61+01	8.30+01	1.07+02	1.41+02	1.58+02	1.69+02	1.76+02
10	6	1.38+07	6.54+01	1.12+02	3.27+02	5.18+02	8.71+02	1.12+03	1.31+03	1.46+03
11	6	0.00+00	2.78+00	2.92+00	2.53+00	2.27+00	1.95+00	1.81+00	1.73+00	1.68+00
12	6	1.50+05	8.21+00	8.88+00	8.76+00	8.51+00	8.32+00	8.34+00	8.42+00	8.51+00
13	6	0.00+00	1.69+01	2.10+01	2.73+01	2.94+01	3.20+01	3.33+01	3.42+01	3.48+01
14	6	4.54+06	2.85+01	4.01+01	7.81+01	1.06+02	1.50+02	1.79+02	2.00+02	2.17+02
15	6	0.00+00	2.98+01	3.87+01	5.32+01	6.18+01	7.43+01	8.06+01	8.42+01	8.66+01
11	7	0.00+00	6.73+00	1.58+01	4.34+01	5.76+01	7.51+01	8.43+01	9.04+01	9.48+01
12	7	7.38+05	9.81+00	1.73+01	4.25+01	6.30+01	1.06+02	1.42+02	1.73+02	2.01+02
13	7	0.00+00	1.43+01	2.54+01	6.16+01	8.43+01	1.15+02	1.32+02	1.42+02	1.50+02
14	7	0.00+00	2.22+01	3.48+01	6.30+01	7.63+01	9.08+01	9.69+01	1.00+02	1.02+02
15	7	0.00+00	2.03+01	2.76+01	4.12+01	4.74+01	5.40+01	5.65+01	5.77+01	5.83+01
11	8	6.45+05	1.10+01	1.81+01	2.95+01	3.45+01	4.46+01	5.37+01	6.19+01	6.93+01
12	8	0.00+00	3.92+01	7.54+01	1.75+02	2.27+02	2.89+02	3.21+02	3.42+02	3.57+02
13	8	1.49+06	4.12+01	7.05+01	1.86+02	2.79+02	4.55+02	5.92+02	7.05+02	8.01+02
14	8	0.00+00	6.91+01	1.15+02	2.41+02	3.15+02	4.14+02	4.65+02	4.98+02	5.21+02
15	8	0.00+00	6.96+01	9.94+01	1.63+02	1.95+02	2.32+02	2.47+02	2.55+02	2.60+02
11	9	0.00+00	1.27+01	1.60+01	1.90+01	2.02+01	2.18+01	2.26+01	2.31+01	2.34+01
12	9	1.89+05	4.19+01	6.05+01	8.41+01	9.00+01	9.77+01	1.05+02	1.11+02	1.17+02
13	9	0.00+00	8.97+01	1.59+02	3.35+02	4.18+02	5.10+02	5.53+02	5.78+02	5.96+02
14	9	2.59+06	1.07+02	1.95+02	5.37+02	8.10+02	1.30+03	1.67+03	1.96+03	2.21+03
15	9	0.00+00	1.70+02	2.61+02	4.79+02	6.11+02	7.92+02	8.88+02	9.50+02	9.93+02
11	10	0.00+00	1.01+01	1.08+01	9.56+00	8.72+00	7.69+00	7.15+00	6.80+00	6.54+00
12	10	0.00+00	3.48+01	4.05+01	3.97+01	3.70+01	3.32+01	3.11+01	2.98+01	2.89+01
13	10	5.05+04	7.51+01	1.03+02	1.32+02	1.32+02	1.26+02	1.22+02	1.22+02	1.22+02
14	10	0.00+00	1.67+02	2.71+02	5.28+02	6.50+02	7.64+02	8.01+02	8.15+02	8.21+02
15	10	4.26+06	3.87+02	7.33+02	1.76+03	2.46+03	3.64+03	4.48+03	5.14+03	5.69+03

[a] Radiative rate.
[b] a±b denotes $a \times 10^{\pm b}$.