Fine Structure effective collision strengths for the electron impact excitation of $S^{VI}$

CLAIRE HUDSON, KENNETH BELL, Queens University Belfast — A 14-state $R$-matrix calculation has been carried out to determine fine structure effective collision strengths for the electron impact excitation of $S^{VI}$. The target states are represented by configuration interaction wavefunctions and consist of the 14 lowest $LS$ states, having configurations $(2p^6)3s^2$, $3s3p$, $3p^2$, $3s3d$, $3s4s$, $3p3d$. These target states give rise to 26 fine structure levels and 325 possible transitions. The fine structure collision strengths have been obtained by transforming to a $jj$-coupling scheme using the JAJOM program of Saraph [1] and have been determined using a sufficiently fine energy mesh which properly delineates the resonance structure. The effective collision strengths were calculated by averaging the electron collision strengths over a Maxwellian distribution of velocities. The non-zero effective collision strengths for transitions between both the $LS$ states and the fine structure levels have been tabulated for electron temperatures ($T_e$) in the range $\log_{10} T_e (K) = 4.0 - 6.0$. Comparisons are made with the earlier 8-state $R$-matrix calculation of Dufton & Kingston [2] and distorted-wave evaluations of Christensen et al [3] and Pradhan [4]. [1] Comp. Phys. Commun., 15, 247 (1978); [2] J. Phys. B, 17, 3321 (1984); [3] Phys. Rev. A, 34, 4704 (1986); [4] Atomic Data & Nuclear Data Tables, 40, 335 (1988).

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