Resonance Structures in Photoionization of $S^+$

SWARAJ TAYAL, Clark Atlanta University — Resonance structures in the photoionization of $S^+$ for the removal of a 3p or 3s electron from the ground 3s$^2$3p$^3$ 4$S^o$ and excited metastable 2$D^o$ and 2$P^o$ states have been studied in the B-spline R-matrix approach. The non-orthogonal orbitals are used for an accurate description of the $S^+$ initial bound states, the final $S^{2+}$ ion plus photoelectron states and $S^{2+}$ ionic thresholds. Calculations have been carried out in 17- and 27-state close-coupling approximations. The relativistic effects have been considered in the Breit-Pauli Hamiltonian. Photoionization cross sections are dominated by 3s$^2$3p$^2$(1$D$)ns 2$D$, 3s$^2$3p$^2$(1$D$)nd 2$F$, 2$D$, 2$P$ and 3s3p$^3$(5$S^o$, 3$S^o$, 3$D^o$, 3$P^o$)np 4$P$ Rydberg series of resonances. Our results will be compared with merged ion-photon beam experiment.

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