

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Electron-Ion Recombination, Photoionization and Dielectronic Satellite Lines of Ca XVIII and Ca XIX Using Unified Method¹ SULTANA NAHAR, The Ohio State University — The unified method is used to study photoionization, electron-ion recombination and dielectronic satellite (DES) lines of highly charged Ca XVIII and Ca XIX. The method which (i) subsumes both the radiative and dielectronic recombinations, (ii) provides self-consistent sets of photoionization and recombination cross sections, has been extended recently to study (iii) the DES spectra with natural profiles and blending of the lines. The method is implemented through relativistic Breit-Pauli R-matrix method using coupled channel wavefunctions. Present calculations include all fine structure levels with $n \leq 10$ and $0 \leq l \leq 9$ which correspond to 98 levels of total angular momenta $1/2 \leq J \leq 17/2$ of Ca XVIII and 193 levels with $0 \leq J \leq 10$ of Ca XIX. Results will be presented with important features for level-specific total and partial photoionization cross sections, total and level-specific recombination rate coefficients, DES spectrum and rate coefficients. They include for He-like Ca XVIII, (i) cross sections and rates for the diagnostic w, x, y, z lines and (ii) resonance strengths and rates for the 22 KLL DES lines, and for Li-like Ca XVII, the cross sections and rates for the ultra-violet lines observed in astrophysical spectra. Comparison is made with available data.

¹Partially supported by NASA

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Date submitted: 26 Jan 2007

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