

Abstract Submitted
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Cross Sections for Electron Scattering from Fe^{11+} Ions¹ SWARAJ TAYAL, Clark Atlanta University — The B-spline Breit-Pauli R-matrix method is used to investigate electron impact excitation of allowed and forbidden transitions in Fe^{11+} in the energy range from threshold to 12.0 Ryd. The relativistic effects are adequately accounted for by using directly fine-structure close-coupling expansions. The multiconfiguration Hartree-Fock method with term-dependent non-orthogonal orbitals is employed for an accurate representation of the target states. The non-orthogonal orbitals allowed us to optimize the atomic wave functions for different target states independently, resulting in more accurate target descriptions than those used in the previous collision calculations. The calculated excitation energies are in excellent agreement with the experimental values. We performed three independent electron scattering calculations by including 41 levels, 90 levels, and 104 levels in the close coupling expansion to check the convergence of results. The distinctive feature of the method is the use of B-splines as a universal basis to represent the scattering orbitals in the inner region. Only limited orthogonality conditions to the continuum orbitals are imposed. The oscillator strengths and cross sections for several transitions will be presented.

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