Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Electron Impact Excitation Collision Strengths for Fine-Structure Transitions in of Fe IX[1] SWARAJ TAYAL, Clark Atlanta University, OLEG ZATSARINNY, Drake University — New extensive calculations are performed for electron collision strengths and transitions probabilities for a wide range of transitions in Fe IX. The collision strengths are calculated in the close-coupling approximation using the B-spline Breit-Pauli R-matrix method. The multiconfiguration Hartree-Fock method in conjunction with B-spline expansions is employed for an accurate representation of the target wave-functions. The close-coupling expansion includes 370 fine-structure levels of Fe IX in energy region up to $3p^5 5s$ states. It includes levels of the $3p^6$, $3p^5 3d, 4l, 5s$, $3s3p^6 3d, 4s, 4p$, $3p^4 3d^2$, $3s3p^5 3d^2$ configurations and some low-lying levels of the $3p^3 3d^3$ configuration. The effective collision strengths are obtained by averaging the electron collision strengths over a Maxwellian distribution of velocities at electron temperatures in the range from 10^4 to 10^7 K. There is a good agreement with the previous R-matrix calculation for transitions between first 17 levels of the $3p^6$, $3p^5 3d$ and $3s3p^6 3d$ configurations. The present results considerably expand the existing data sets for Fe IX, allowing more detailed treatment of the available measured spectra from different space observatories.

[1]This research is supported by NASA under grant NNXX11AB62G from the Solar and Heliospheric Physics Program and NSF under grant PHY0244470

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Date submitted: 31 Jan 2014 Electronic form version 1.4