Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Photoionization of ground and excited states of Ca^+ and comparison along the isoelectronic sequence A.M. SOSSAH, H.-L. ZHOU, S.T. MANSON, Georgia State University — Photoionization cross section calculations are performed on the ground ($[Ne]3s^2 3p^6 4s \;\; {}^2S^e_{1/2}$) and the first two excited ($[Ne]3s^2 3p^6 3d \;\; {}^2D^e_{3/2}$ and $[Ne]3s^2 3p^6 3d \, {}^2D^e_{5/2}$) states of Ca^+ ions for photon energies from threshold to 45.0 eV using the relativistic (Breit-Pauli) R-matrix method. The discrete Ca^{2+}orbitals are generated using the computer program AUTOSTRUCTURE; 30 configurations are included in the configuration-interaction (CI) calculation for Ca^{2+}. The most prominent $3p \rightarrow 3d$ giant resonances are analyzed and identified, and our results are compared with experimental results, and rather good agreement is found. Using results of our previous photoionization calculations on Sc^{2+} and Ti^{3+} ions, the strongest and broadest resonances in the photoionization cross section of those three ions (Ca^+, Sc^{2+} and Ti^{3+}), are compared in terms of width and oscillator strengths to show the evolution as a function of nuclear charge.
This work is supported by DOE and NSF.

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Date submitted: 21 Jan 2010 Electronic form version 1.4