Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Electron Impact Ionization Cross Sections in Rb and Cs. T.J. REDDISH, M. LUKOMSKI, S. SUTTON, W. KEDZIERSKI, J.W. MCCONKEY, University of Windsor, Canada, K. BARTSCHAT, Drake University, USA, P.L. BARTLETT, A.T. STELBOVICS, I. BRAY, Murdoch University, Australia — We present a new atom trapping technique for determining absolute, total ionisation cross sections (TICS) out of an excited atom. The novel feature of this method is in utilizing Doppler cooling of neutral atoms to determine ionisation cross sections. This fluorescence-monitoring experiment, which is a variant of the 'trap loss' technique, has enabled us to obtain the experimental electron impact ionisation cross sections out of the Cs $6^2P_{3/2}$ excited state between 7 - 400 eV. New CCC, R-Matrix with Pseudo-States (RMPS), and Born approximation single ionisation cross sections (SICS) are also presented for both the ground and excited states of Cs and Rb, and compared with the available experimental data. The comparison of the results reveals the importance of the autoionisation and multiple ionisation contributions to the TICS. The autoionisation contribution appears to be substantial for ionisation out of the Cs 6^2P and Rb 5^2P excited states; $\sim$ 3-4 larger than the direct ionisation contribution predicted by CCC at $\sim$ 30-50 eV. This surprising result shows the importance of multi-electron processes in determining the ionisation cross sections of heavy alkali atoms.

Timothy Reddish
University of Windsor

Date submitted: 23 Feb 2006 Electronic form version 1.4