

Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Dramatic Resonances in Low-Energy Electron Elastic Scattering from Rb, Cs, Ba, La and Fr Atoms: Signatures of Electron Affinities¹ A.Z. MSEZANE, Z. FELFLI, Clark Atlanta University, DMITRI SOKOLOVSKI, The Queen's University of Belfast, UK — We predict dramatic resonances in low-energy electron elastic total cross sections for Rb, Cs, Ba, La and Fr atoms whose energy positions are identified with the electron affinities (EA's) for these atoms, preceded by shape resonances and Ramsauer-Townsend minima. This provides a new powerful theoretical method of determining unambiguous EA values for atoms. The extracted EA values for Rb, Cs, Ba and La atoms agree very well with the most recently measured values, but our value for Fr disagrees significantly with existing calculated values (there are no experimental EA's for the Fr atom). The calculation used the recent Regge-pole methodology [1] with a Thomas-Fermi potential incorporating the vital core- polarization interaction. Results will be compared with other available data.

[1] D. Sokolovski, Z. Felfli, S. Yu. Ovchinnikov, J. H. Macek and A. Z. Msezane, Phys. Rev. A **76**, 012705 (2007)

¹Work supported by US DOE, Division of Chemical Sciences, Biosciences and Geosciences and NSF-CREST Program.

Z. Felfli
Clark Atlanta University

Date submitted: 02 Feb 2008

Electronic form version 1.4