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**Electron Affinity Calculations for Atoms: Sensitive Probe of Many-Body Effects** Z. FELFLI, A. Z. MSEZANE, Clark Atlanta University — Electron–electron correlations and core-polarization interactions are crucial for the existence and stability of most negative ions. Therefore, they can be used as a sensitive probe of many-body effects in the calculation of the electron affinities (EAs) of atoms. The importance of relativistic effects in the calculation of the EAs of atoms has recently been assessed to be insignificant up to Z of 85[1]. Here we use the complex angular momentum (CAM) methodology [2] wherein is embedded fully the electron–electron correlations, to investigate core-polarization interactions in low-energy electron elastic scattering from the atoms In, Sn, Eu, Au and At through the calculation of their EAs. For the core-polarization interaction we use the rational function approximation of the Thomas-Fermi potential, which can be analytically continued into the complex plane. The EAs are extracted from the large resonance peaks in the CAM calculated low-energy electron-atom scattering total cross sections and compared with those from measurements and sophisticated theoretical methods. It is concluded that when the electron-electron correlations and core polarization interactions (both major many-body effects) are accounted for adequately the importance of relativity on the calculation of the EAs of atoms can be assessed. Even for the high Z (85) At atom relativistic effects are estimated to contribute a maximum of 3.6% to its EA calculation. [1] Z. Felfli and A.Z. Msezane, J. Phys. B, Submitted (2015) [2] D. Sokolovski *et al*, Phys. Rev. A **76,** 026707 (2007)

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