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Low-Energy Electron Elastic Differential Cross Sections for Lanthanide Atoms A.Z. MSEZANE, Z. FELFLI, Clark Atlanta University, D. SOKOLOVSKI, Queen's University of Belfast, UK — Recently [1] the near-threshold electron attachment mechanism in electron-lanthanide atom scattering was investigated using the recently developed Regge-pole analysis through the calculation of the electron elastic total cross sections (TCSs) [2]. Generally, the TCSs were found to be characterized by extremely narrow resonances whose energy positions were identified with the binding energies (BEs) of the negative ions formed during the collisions as Regge resonances. Here we have selected typical lanthanides, determined through their formation of tenuously bound (BE $<$ 0.1eV), weakly bound (BE $<$ 1eV) and complicated open d- and f-sub-shell negative ions in the near-threshold electron elastic scattering, to investigate the structure of their differential cross sections (DCSs) in angle in the electron impact energy range 0$<$ E $\leq$ 1eV. The DCSs in energy at scattering angles $\theta = 0^\circ, 90^\circ$ and 180° are presented as well; these readily yield the BEs of the negative ions formed during the collisions [3]. Consequently, a new simple experimental procedure is suggested for measuring reliably the BEs of negative ions in general. Also determined are the so-called DCS critical minima. [1] Z. Felfli *et al*, Phys. Rev. A **79**, At Press (2009) [2] D. Sokolovski *et al*, Phys. Rev. A**76**, 012705 (2007) [3] Z. Felfli *et al,* Phys. Rev. A **78**, 030307 (R) (2008) Supported by U.S. DOE, Division of Chemical Sciences.

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