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Elastic Differential and Integral Elastic Cross Sections for e^--Fr Z. FELFLI, Clark Atlanta University, D. SOKOLOVSKI, Queen's University of Belfast,UK, A.Z. MSEZANE, Clark Atlanta University, FELFLI/MSEZANE TEAM, SOKOLOVSKI COLLABORATION — Since an integral cross section is obtained by summing a partial wave series, singularities of the scattering matrix in the complex plane of the total angular momentum (Regge poles) are instrumental in understanding resonance effects in elastic, inelastic and reactive collisions. Typically, a resonance would not affect the energy dependence of an integral cross section $\sigma(E)$ if its angular life is much shorter than one full rotation of the metastable complex. In the opposite limit, a resonance would manifest itself as a sharp Breit-Wigner peak in $\sigma(E)$. We illustrate this on the Thomas-Fermi model foe e^--Fr scattering[1]. Specifically, elastic partial and integral cross sections are investigated in the near threshold energy regime to understand the mechanism of electron attachment and predict new manifestations. We benchmark our approach by comparing the calculated results with those from the recent Dirac R-matrix method[2]. Results will be presented that highlight the existence of a shape resonance at E= 0.034 eV, in agreement with the Bahrim *et al.* results. Interestingly, a new sharp f-resonance appears at E = 0.354 eV and a p-wave Wigner threshold behaviour is identified. The general agreement with the Dirac R-matrix results gives credence to our simple approach.
[1] Z. Felfli *et al.*, J. Phys. B **39**, L353 (2006)
[2] C. Bahrim *et al.*, Phys. Rev. A **63**, 042710 (2001)

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