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Regge Oscillations in Electron-Atom Total Scattering Cross Sections? D. SOKOLOVSKI, Queen's University of Belfast, S. YU. OVCHINNIKOV, University of Tennessee, Knoxville, Z. FELFLI, Clark Atlanta University, J. H. MACEK, University of Tennesee, Knoxville, A. Z. MSEZANE, Clark Atlanta University, QUB COLLABORATION, UTK TEAM, CAU TEAM — In quantum scattering, the presence of a sufficiently narrow resonance allows the collision partners to form a long-lived intermediate complex which rotates as it decays to preserve the total angular momentum. Here we consider a system trapped in such a resonance state and allow it to decay at zero scattering angle, which through the optical theorem can be related to the total cross section (TCS). If the complex has a large angular life, it will return to forward scattering many times. For the resonance to contribute to the TCS requires: (i) Several rotations of the complex (Regge trajectory stays close to real axis) and (ii) Coherent addition of forward scattering sub-amplitudes (real part of Regge pole is close to an integer). Our analysis is based on the recent complex angular momentum approach [1] used to explain low energy oscillations in proton-H collision. Specifically, we want to establish whether similar oscillations can also be observed in electron-atom scattering. To this end, we present a detailed analysis of Regge trajectories and their contributions to the TCS for the model Thomas-Fermi potential.

1. J. H. Macek *et al.*, Phys. Rev. Lett. **93**, 183203 (2004).

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