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Differential Electron Scattering from Fundamental Atoms and Molecules

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A brief survey of recent work, in our laboratory, on the differential scattering of low energy electrons from H, He, H_2 and N_2 will be presented. This work includes accurate measurements of doubly-differential ionization cross-sections for electron impact ionization of H using a novel moveable source method [1] and an extension of this to the electron impact single ionization of He [2]. We will also present ongoing work in electron-molecule collisions, and discuss recent observations on interference effects in the electron impact, vibrational excitation, of N_2 Rydberg states [3] and the resulting break-down of the Franck-Condon principle.

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References:

[1] M. Hughes et al., Meas. Sci. Technol. 14, 841 (2003).
[2] E. Schow et al., Contributed Poster, DAMOP 2005.
[3] B. R. Lewis et al., Phys. Rev. A, 2005 in press.