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Theoretical and experimental (e,2e) studies for isoelectronic atoms and molecules – Ne and CH₄¹

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Very recently, experimental and theoretical studies of electron impact ionization of He and H₂ revealed new physical effects for ionization of both atoms and molecules. In this talk, a similar study will be reported for atoms and molecules with 10 electrons. The theoretical calculations for this study were performed at Rolla and the experimental measurements were made at Manchester, England by Andrew Murray's group and at Heidelberg Germany by Alexander Dorn's group. All the experimental measurements were performed for relatively low electron energies. In Manchester, measurements were made for the highest occupied molecular orbital (HOMO) and the next highest occupied molecular orbital (NHOMO) of CH₄ for coplanar and perpendicular plane symmetric geometry. In Heidelberg, measurements were made for the 1t₂ state in coplanar and half perpendicular plane asymmetric geometry. The experimental measurements will be compared to M3DW (molecular 3-body distorted wave) results for CH₄ and atomic 3DW results for Ne.

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