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Deep minimum in the Coulomb-Born TDCS for e^--H, e^--He and e^+-He ionization[1] C. M. DEMARS, University of North Texas, J. B. KENT, University of North Texas, Southern Methodist University, S. J. WARD, University of North Texas — A deep minimum in the experimental measurements [1] of the triply differential cross section (TDCS) for electron-helium ionization has been attributed to a vortex in the velocity field that is associated with the ionization amplitude [2]. The deep minimum has been theoretically obtained using the time-dependent close-coupling and distorted-wave methods [3]. We have shown that the Coulomb-Born approximation is able to obtain the deep minimum in the TDCS for electron-helium ionization. Furthermore, we have shown that within this approximation a deep minimum is present for electron-hydrogen ionization and for positron-helium ionization. These minima are due to vortices in velocity field that is associated with the transition matrix element. Previously, vortices have been shown to exist for positron-hydrogen ionization [4]. [1] A. J. Murray and F. H. Read, Phys. Rev. A **47**, 3724 (1993). [2] J. H. Macek, J. B. Sternberg, S. Y. Ovchinnikov and J. S. Briggs, Phys. Rev. Lett. **104**, 033201 (2010). [3] J. Colgan, O. Al-Hagan, D. H. Madison, A. J. Murray and M. S. Pindzola, J.Phys.B **42** 171001 (2009). [4] F. Navarrete and R. O. Barrachina, J.Phys.B **48**, 055201 (2015).

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Cody DeMars
University of North Texas

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