

Abstract Submitted
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A simulation study of Methane by proton at low energies¹ EDWIN E. QUASHIE, Department of Physics, Florida A&M University, Tallahassee, FL-32307, ALFREDO A. CORREAA, ERIC R. SCHWEGLER, Lawrence Livermore National Laboratory, Livermore, CA, BIDHAN C. SAHA, Department of Physics, Florida A&M University, Tallahassee, FL-32307 — Proton impact molecular collisions have received considerable attentions over last few decades due to wide applications in various fields such as plasma physics, astrophysics, material science, and radiation therapy. Methane is the simplest hydrocarbon and has recently been detected in the atmosphere of the outer planets. In addition to provide the fundamental information, the charge exchange studies [1] remain critical for understanding the phenomena in studies of comets, the solar wind, and space weather. The charge exchange processes in recent years have been used as diagnostics for temperature and transport. Using the time dependent density functional theory [2] our results for both the elastic and inelastic scattering will be presented.

[1] B. H. Bransden and M R C MacDowell, *Charge Exchange and the Theory of Ion-Atom Collisions* (Oxford Univ. Press, NY 1992).

[2] E. Runge and E. K. U. Gross, Phys. Rev. Lett 52, 997 (1984).

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