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Fragmentation of methane molecules by antiproton impact[1]
ARASH SALEHZADEH, TOM KIRCHNER, York University — Extending previous work for proton impact [1], we have investigated the fragmentation of methane molecules due to collisions with antiprotons in the 25 keV to 5 MeV impact energy range. The multi-center nature of the problem is addressed by using a spectral representation of the molecular Hartree-Fock-level Hamiltonian and a single-center expansion of the initially populated molecular orbitals. The two-center basis generator method (TC-BGM) is used for orbital propagation. Electron-removal cross sections obtained from the TC-BGM solutions are complemented with a dynamical decay-route fragmentation model [2] to calculate cross sections for the production of fragment ions. Good agreement with the available experimental data [3] is observed for CH_4^+, CH_3^+, CH_2^+ and CH^+. [1] A. Salehzadeh and T. Kirchner, J. Phys. Conf. Ser. **635**, 032077 (2015). [2] H. Luna *et al.*, J. Phys. B **36**, 4717 (2003). [3] H. Knudsen *et al.*, J. Phys. B *28*, 3569 (1995).

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