Nonlocal complex potential theory of dissociative electron attachment: Inclusion of two vibrational modes[1] HARINDRANATH AMBALAMPITIYA, ILYA FABRIKANT, University of Nebraska - Lincoln — Dissociative electron attachment (DEA) process is important for many applications in plasma industry and radiation damage [1]. Theory of DEA to polyatomic molecules often includes a single vibrational mode in the target molecule, with all the other modes being "frozen". In the local approximation [2] of DEA, the nuclear motion of the intermediate negative-ion state is described by a Schrödinger equation with a local complex potential which is an approximation to a non-local energy-dependent complex operator [3]. Previous non-local DEA calculations assumed only one nuclear degree of freedom in the target molecule. In the present paper we extend the non-local theory by inclusion of two or more degrees of freedom in the target molecule. The theory is then applied to DEA to the CF_3Cl molecule by inclusion of the C-Cl symmetric stretch and CF_3 "umbrella" modes. The DEA cross section for specific vibrational states and temperature-averaged cross sections are obtained and compared with the previous theoretical results an experiments. [1] I. I. Fabrikant *et al.*, Adv. At., Mol.,Opt. Phys. **66**, 545 (2017). [2] D. T. Birtwistle and A. Herzenberg, J. Phys. B: At. Mol. Phys. **4**, 53 (1971). [3] J. N. Bardsley, J. Phys. B: At. Mol. Phys. **1**, 349 (1968)

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