

Abstract Submitted
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Nonlocal resonance model for two nuclear degrees of freedom¹

MARTIN FORMANEK, KAREL HOUFEK, Institute of Theoretical Physics, Faculty of Mathematics and Physics, Charles University in Prague — A nonlocal resonance model (NRM) [W. Domcke, Phys. Rep. 208, 97 (1991)] is a commonly used method of calculating cross sections for elastic and inelastic processes in resonant electron-molecule collisions. Up to now, there has been a great number of studies devoted to implement this approach for molecules with only one nuclear degree of freedom (e.g. N₂, H₂, HCl etc) In the present work we developed a generalization of the NRM for two degrees of freedom. For testing purposes we have constructed two dimensional model, which captures essential features of resonant collisions of electrons with the CO₂ molecule. Final cross sections for few chosen vibrational excitations are being compared with results obtained via a local complex potential approximation, which is so far the only approach dealing with multidimensional phenomena [C.W. McCurdy et al, Phys. Rev. A 67, 042708 (2003)]. We also discuss difficulties arising, when one chooses to work in a time dependent or a time independent formalism.

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Martin Formanek
Institute of Theoretical Physics, Faculty of Mathematics and Physics,
Charles University in Prague

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