Abstract Submitted
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Vibronic excitation cross sections and rate coefficients of CH+ by electron impact[1] XIANWU JIANG, SPMS, CentraleSuplec, Universite Paris-Saclay, 8-10 rue Joliot-Crurie, 91190 Gif-sur-Yvette, France, CHI HONG YUEN, Department of Physics, University of Central Florida, Orlando, FL 32816, USA, PIETRO CORTONA, SPMS, CentraleSuplec, Universit Paris-Saclay, 8-10 rue Joliot-Crurie, 91190 Gif-sur-Yvette, France, VIATCHESLAV KOKOOULINE, Department of Physics, University of Central Florida, Orlando, FL 32816, USA, MEHDI AYOUZ[2], LGPM, CentraleSuplec, Universit Paris-Saclay, 8-10 rue Joliot-Crurie, 91190 Gif-sur-Yvette, France, PIETRO CORTONA TEAM, VIATCHESLAV KOKOOULINE TEAM, MEHDI AYOUZ TEAM — The vibronic excitations of CH+ by electron impact are of great importance in astrophysical and technological plasmas. However, this process is far from being precisely modeled in theory. We propose a new model that combines the multichannel quantum defect theory (MQDT) and the UK R-matrix code to compute cross sections and thermally-averaged rate coefficients for vibronic (de-)excitation of CH+ by an electron impact. In this model, the R-matrix formalism is employed to evaluate the electron-ion scattering matrix for a fixed geometry of the ion. The scattering matrix describing the vibronic transition is obtained from the vibronic frame transformation and close-channel-elimination procedure which are applied at high scattering energies where the scattering matrix is smooth. For the obtained rate coefficients, fitting formulas are derived. The interval of applicability of the formulas is from 40 to 10,000 K.

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