

# Electron-impact excitation of molecular hydrogen: dissociation and vibrationally resolved cross sections

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Molecular hydrogen and its isotopologues (D<sub>2</sub>, HD, etc.) are present in a range of vibrationally excited states in fusion, atmospheric, and interstellar plasmas. Electron-impact excitation cross sections resolved in both final and initial vibrational levels of the target are required for modeling the properties and dynamics, and controlling the conditions of many low-temperature plasmas. Recently, the convergent close-coupling (CCC) method [1] has been utilized to provide a comprehensive set of accurate excitation, ionization, and grand total cross sections for electrons scattering on H<sub>2</sub> in the ground (electronic and vibrational) state [2,3,4], and calculations are being conducted to extend this data set to include cross sections resolved in all initial and final vibrational levels [5]. In this talk I will review the available e-H<sub>2</sub> collision data, discuss the resolution of a significant discrepancy between theory and experiment for excitation of the b<sup>3</sup>Σ<sub>u</sub><sup>+</sup> state [6], and present estimates for dissociation of H<sub>2</sub> [7].

## References

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