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H2 dissociation due to collision with He[1] LUKE OHLINGER, ROBERT C. FORREY, Penn State University at Berks, TECK-GHEE LEE, Oak Ridge National Laboratory, PHILLIP STANCIL, University of Georgia — Cross sections for dissociation of H_2 due to collision with He are calculated for highly excited rovibrational states using the quantum mechanical coupled states approximation. An L^2 Sturmian basis set with multiple length scales is used to to provide a discrete representation of the H_2 continuum which includes orbiting resonances and a non-resonant background. Cross sections are given over a range of translational energies for both resonant and non-resonant dissociation together with the most important bound state transitions for many different initial states. The results demonstrate that it is possible to compute converged quantum mechanical cross sections using basis sets of modest size. It is found that collision induced dissociation competes with inelastic scattering as a depopulation mechanism for the highly excited states. The relevance of the present calculations to astrophysical models is discussed.

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