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Spectroscopically Accurate Calculations of the Rovibrational Energies of Diatomic Hydrogen JASON PERRY, PHILLIP STANCIL, Department of Physics, University of Georgia, CENTER FOR SIMULATIONAL PHYSICS TEAM — The Born-Oppenheimer approximation has been used to calculate the rotational and vibrational states of diatomic hydrogen. Because it is an approximation, our group now wants to use a Born-Oppenheimer potential to calculate the electronic energy that has been corrected to match closely with spectroscopic results. We are using a code that has corrections for adiabatic, relativistic, radiative, and non-adiabatic effects. The rovibrational energies have now been calculated for both bound and quasi-bound states. We also want to compute quadrupole transition probabilities for diatomic hydrogen. These calculations aspire to investigate diatomic hydrogen in astrophysical environments.

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