

Abstract Submitted
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Spectroscopy of Vibrational States in Diatomic Nitrogen Molecules MARY MULHOLLAND, CHARLES HARRILL, SETHFIELD SMITH, Francis Marion University — This project is focused on understanding the vibrational structure of nitrogen, which is a homonuclear diatomic molecule. A 5000V AC discharge will be used to selectively excite neutral nitrogen molecules to a particular electronic state. By performing spectroscopy on the electronic transitions from this state to a lower electronic state, the data should only show those vibrational bands which connect the two electronic states. Assuming that a number of vibrational levels are populated in the higher energy electronic state, the electronic transitions to all of the allowed vibrational levels in the lower energy electronic state should provide sufficient data to determine the vibrational structure of both states. Emission spectra will be collected with a Thorlabs CCS200 Compact Spectrometer. The spectrometer has a range of 200-1000 nm with a resolution of less than 2 nm and is sensitive enough to resolve the vibrational states in diatomic nitrogen molecules. The results will be compared to a simple harmonic oscillator model.

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