

## VELOCITY MODULATION SPECTROSCOPY OF MOLECULAR IONS IN A SUPERSONIC SLIT JET DISCHARGE

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We report an experimental apparatus for velocity modulation spectroscopy of molecular ions in a supersonic slit jet discharge. Rotationally and translationally ( $T \approx 25$  K) molecular ions are generated in a glow discharge, slit supersonic expansion. Detection of the ions is achieved via direct absorption of a high resolution ( $\approx 2$  MHz) near infrared laser. Electrodes aligned perpendicular to the slit expansion provide a modulating electric field (300-500 V/cm at 30-100 KHz) which in turn modulates the absorption via Doppler shifts of the molecular ions. Lock-in detection at the modulation frequency provides discrimination both from low frequency noise and neutral species absorption. The sensitivities achieved and possible limitations will be discussed. Additionally, the most recent results obtained with this apparatus will be presented.