

DEVELOPMENT OF A CBGB SOURCE AND A QCL LASER SYSTEM FOR STUDYING THE IR SPECTROSCOPY OF CLUSTERS

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We report progress on the construction and development of a cryogenic buffer gas beam (CBGB) instrument for studying the IR spectroscopy of atomic and molecular clusters. Clusters are produced via laser ablation of a solid target inside the CBGB cell, and the nascent clusters are quickly cooled to the buffer gas temperature before exiting the CBGB cell. Upon exiting the cell, the clusters are probed with $\sim 5 \mu\text{m}$ tunable light from a quantum cascade laser (QCL). Light from signal and reference beams each hit a detector, and the difference signal is collected using an autobalanced subtractor circuit to achieve shot-noise limited measurements. Recent developments in the construction of the instrument will be presented.