# RECENT WORK IN HIGH RESOLUTION ROVIBRATIONAL SPECTROSCOPY AT THE *INSTITUTO DE ESTRUCTURA DE LA MATERIA* IN MADRID

Julio Santos, José L. Doménech, Raúl Z. Martínez, Dionisio Bermejo,
*Instituto de Estructura de la Materia (C.S.I.C), Serrano 123, 28006 Madrid, SPAIN.*

In the past few years, two different laser spectroscopy techniques, Difference Frequency Laser Infrared and Stimulated Raman, have been implemented in our laboratory, and applied to gas phase high resolution studies of rovibrational spectra of small molecules either in bulk, discharge cell or supersonic jet environments. We shall report on the latest results on these experiments.

The Raman technique -instrumental linewidth 70 MHz- has been used to obtain near Doppler-limited spectra of infrared inactive fundamental transitions, and to study energy relaxation in a supersonic jet. It has recently been adapted to the study of higher vibrational levels by using a Raman-Raman double resonance technique. Results on $2\nu_1$ state of $CH_4$ will be presented. [a]

The Doppler-limited DFIR -instrumental linewidth 3 MHz- has been applied to the study of inert molecules and of the methyl radical generated in an amplitude modulated, hollow cathode discharge cell. Currently, it is being used to study line broadening and shifting at moderate pressures (up to 1 bar). We shall briefly report on lineshifts of rovibrational lines in the overtone CO band, both self-perturbed and perturbed by foreign gases $N_2$, $O_2$, He and Kr. [b]

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[a] Work done in cooperation with J.P. Champion and J. C. Hilico from the Université de Bourgogne, Dijon, France.
[b] Work done in collaboration with J-P. Bouanich and C. Boulet from the LPMA, Université Paris-Sud, France.