ION HIGH RESOLUTION FOURIER TRANSFORM DIFFERENTIAL SPECTROSCOPY.

NATHALIE PICQUÉ, GUY GUELACHVILI, *Laboratoire de Physique Moléculaire et Applications*[(a)], *Unité Propre du CNRS, Université Paris-Sud, Bâtiment 350, 91405 Orsay-Cedex, France (email: Nathalie.Picque@lpma.u-psud.fr)*; SVATOPLUK CIVIŠ, *I. Heyrovsky, 18223 Prague 8, Czech Republic.*

[(a)] *Associé aux Universités Paris-Sud, et P. et M. Curie*.

The easy recognition of the ionic nature of spectrally observed molecules has proven to be very useful after the development of the velocity modulation laser technique by Gudeman and Saykally[a]. Extension of the same method to wideband FT spectra has already been tried[b], and very successfully applied to plasma diagnostics by Hong and Miller[c]. To our knowledge, no other results are actually published using Doppler modulation Fourier transform spectroscopy. This is the main motivation of the present work.

We describe the first attempt to get simultaneously the selective and non selective high resolution FT spectra. The principle is similar to the low resolution vibrational circular dichroism double modulation approach by Nafie and Vidrine[d]. A 1.25 kHz ac voltage is applied to the emitting discharge tube and detected on two channels in quadrature, while the interferometer path difference is modulated at 0.25 kHz. Tests are performed on the Δv = 1 sequence vibration-rotation bands of ArH^+ in the 2500 cm^{-1} region.

[a] C.S. Gudeman, and R.J. Saykally, Annu. Rev. Phys. Chem., **35**, 387 (1984).

[b] P.A. Martin, and G. Guelachvili, Phys. Rev. Lett., **65**, 2535-2538 (1990).

[c] X. Hong, and T.A. Miller, J. Chem. Phys., **103**, 8821-8827 (1995) (and references therein).

[d] L.A. Nafie, and D.W. Vidrine, in Fourier Transform Infrared Spectroscopy, edited by J.R. Ferraro and L.J. Basile (Academic Press, New York), vol. **3**, 83-123, 1982.