SELECTIVE AND TIME-RESOLVED FOURIER TRANSFORM ION SPECTRA.

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This paper illustrates some aspects of the work begun at LPPM in the field of Fourier Transform Ion Spectroscopy. Double-modulation and time-resolved emission FT spectra of molecular ions, created in glow discharges, are presented. The processing of first derivative-type selective lineshapesa is discussed. Results aiming at characterizing the transport properties and the abundance of ions in plasmas are reported.

As an illustration, the quantum dependence of the average mobility of ArH+ in an Ar/He mixture in an inhomogeneous electric field has been investigated from Doppler-shifts measurementsb. This first demonstration extends to wide-band spectroscopy the measurements pioneered by Haese, Pan, and Oka’ with diode-lasers, in similar source conditions. Spectroscopic means can now provide high quality state-resolved plasma characterization, as proven with lasers, in homogeneous electric fields, for instance in Leone’s groupc.

The determination of the rovibrational intensities of the Δν=1 sequence of ArH+ has been undertaken. First attempts to observe ionic species in C, N, H containing electrical discharges are also reported.