IMPROVEMENTS OF THE FANTASIO EXPERIMENTAL SETUP

A.S. BOGOMOLOV, R. GLORIEUX, T. CORBO, *Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Chemin du cyclotron, 2, 1348, Louvain-la-Neuve, Belgium*; **M. HERMAN**, *Spectroscopy, Quantum Chemistry and Atmospheric Remote Sensing, Faculté des Sciences, Université libre de Bruxelles, 50 ave. F-D Roosevelt, B-1050, Brussels, Belgium*; **C. LAUZIN**, *Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Chemin du cyclotron, 2, 1348, Louvain-la-Neuve, Belgium*

The FANTASIO[1] is an experimental setup for measuring highly resolved rovibrational spectra of molecules and van der Waals complexes formed in a supersonic expansion. The continuous wave cavity ringdown spectrometer is used for probing the species in the near IR region ($\sim$1.4 μm, 0.9 eV). A pulsed slit nozzle is used to increase the interaction path between the laser and the molecular beam. In the present work, I will show the last improvements of the slit nozzle including its new design and the profile of the new slit jaws. The valve can produce expansion from the slit nozzle with a length of up to 80 mm. This provides really intense molecular beam with homogeneous density and temperature distributions along the slit. This new design will be compared with our previous valve based on a 30 mm long slit and Parker series 9 valve with a multichannel bloc[2].

Consequently, of the increase of signal-to-noise ratio new rovibrational bands of H_2O-Ar in the 2OH stretching overtone range were observed and will be presented.

[1] doi:10.1080/00268970601063820, M. Herman, K. Didriche, D. Hurtmans, B. Kizil, P. Macko, A. Rizopoulos, P. Van Poucke, *Molecular Physics*, 105:5-7, 815–823 (2007).

[2] doi:10.11575/PRISM/26361, J. Norooz Oliaee, Doctoral thesis, University of Calgary, Calgary, Canada.