PHOTOELECTRON VELOCITY MAP IMAGING OF VIBRATIONALLY EXCITED, GAS-PHASE BIOMOLECULES AND THEIR ANIONS

DANIËL BAKKER, SJORS BAKELS, RUTGER VAN DER MADE, ATZE PETERS, ANOUK RIJS, *FELIX Laboratory, Institute for Molecules and Materials (IMM), Radboud University, Nijmegen, Netherlands*.

A powerful method in spectroscopy to characterize the structure of large, gas phase molecules is to probe the ionization yield upon irradiating the molecules with infrared (IR) and/or ultraviolet (UV) radiation. When this spectroscopic technique is employed, the photodetached electrons are usually ignored, although they contain information on, for example, the ionization threshold of the molecule and the excited states of the formed ions.

Here, the novel combination of a molecular beam mass spectrometer equipped with a laser desorption source, the free electron laser FELIX and the powerful velocity map imaging (VMI) technique is presented. With this extended set of tools we can bring large molecules intact into the gas phase and prepare them in specific vibrationally excited states. UV or VUV radiation can subsequently be used to ionize the molecules. The kinetic energy and the radial distribution of the photoelectrons can be measured using VMI combined with ion detection using a time-of-flight mass spectrometer.