Contribution ID: **36** Type: **not specified**

Molecular dynamics in small molecules studied by wavelength-selected femtosecond XUV pulses

Since demonstration of high-order harmonic generation (HHG) by femtosecond laser pulses, time-resolved XUV spectroscopy has become an attractive tool to study molecular dynamics via detection of charged particles (electrons and ions). Information collected in these experiments is typically complicated due to broad spectral content of the HHG sources. In this contribution we present implementation of an HHG-based time-compensating XUV monochromator, which is used to spectrally filter the wavelength of the XUV radiation, while keeping the temporal pulse profile unchanged. We use this setup in combination with a velocity map imaging spectrometer to investigate time-resolved dynamics of dissociative ionization of N2 molecules close to double-ionization threshold (35-50 eV). It is demonstrated how wavelength selectivity of XUV together with charged-particle detection helps to unravel ionization pathways of the molecule and map high-lying potential energy surfaces with energy resolution comparable to accuracy of quantum chemistry methods available today. First results on dynamics in triatomic molecules, such as CO2 and NO2, will also be presented.

Primary author: Dr KORNILOV, Oleg (Max-Born-Institute)

Co-authors: YANG, Chung-Hsin (Max-Born-Institute); Dr FRASSETTO, Fabio (LUXOR); Dr POLETTO, Luca (LUXOR); Prof. VRAKKING, Marc (Max-Born-Institute); KUBIN, Markus (HMC, HZB); Mr ECKSTEIN, Martin (Max-Born-Institute)

Presenter: Dr KORNILOV, Oleg (Max-Born-Institute)

Session Classification: Molecular dynamics 2