

Plenary Talk

PV XIII Thu 8:15 U Audimax

Probing electronic processes in large molecules — ●FRANCESCA CALEGARI — Center for Free Electron Laser Science, DESY, Notkestrasse 85 22607 Hamburg Germany

Attosecond science is nowadays a well-established research field, which offers formidable tools for the realtime investigation of electronic processes [1]. In this context, we have recently demonstrated that attosecond pulses can initiate charge migration in aromatic amino-acids [2]. Still, there is a long path towards attochemistry and the full control of the molecule via electronic coherences.

In this talk I will first present a time-resolved study of photo-fragmentation of adenine. Our most intriguing observation is that a

stable dication of the parent molecule can be produced if the probing NIR pulse is briefly delayed from the XUV pulse. Our findings indicate that this time is required for a shake-up process to occur. After shake-up, a second electron can be ionized and the molecule is ultimately stabilized.

In the second part of the talk I will show the results obtained in the C60 molecule. Here we have investigated delays in photoemission after exciting the Giant surface Plasmonic Resonance (GPR) around 20 eV. Clear signatures of the collective electron dynamics initiated by the XUV pulse can be extracted from the experimental data.

[1] F. Calegari et al., J. Phys. B 062001, 49 (2016) [2] F. Calegari et al, Science 346, 336 (2014)