K 2: Licht- und Strahlungsquellen I

Time: Monday 15:30–16:00 Location: V57.04

K 2.1 Mon 15:30 V57.04

High-energy, 3.3-octave spanning supercontinuum in bulk driven at mid-IR — •Matthias Baudisch[1], Francisco Silva[1], Dane Austin[1], Alexandre Thai[1], Michaël Hemmer[1], Arnaud Couairon[2], and Jens Biegert[1,3] — [1]ICFO - Institut de Ciencies Fotoniques, 08860 Castelldefels, Barcelona, Spain — [2]Centre de Physique Theorique, Ecole Polytechnique, CNRS UMR 7644, F-91128 Palaiseau Cedex, France — [3]ICREA - Institucio Catalana de Recerca i Estudis Avançats, 08010 Barcelona, Spain

Ultra-broadband, coherent radiation has a rising importance for many applications such as optical coherence tomography and multicolor pump-probe spectroscopy. In this work we demonstrate the generation of a supercontinuum in yttrium aluminum garnet (YAG) spanning from the visible up to the mid-IR. The pump pulses centered at 3100 nm were provided by a home-built optical parametric chirped pulse amplifier delivering carrier-envelope phase stable pulses with 10 μJ of pulse energy, 67 fs duration and 160 kHz repetition rate. For the experiment the beam was focused into a 2 mm-thick YAG plate. The detection was realized using three detectors to cover the entire spectral extend of the continuum. The measured spectrum spans smoothly from 450 nm up to 4500 nm with high spectral energy densities from 2 pJ/nm in the 750-1000 nm spectral range up to 10 nJ/nm around the mid-infrared pump wavelength.

K 2.2 Mon 15:45 V57.04

Photodissociation of $Fe(CO)_5$ studied by femtosecond RIXS — •Kristjan Kunnus[1], Martin Beye[1], Alexander Föhlisch[1], Kelly Gaffney[5], Frank De Groot[8], Sebastian Grübel[2], Robert Hartsock[5], Franz Hennies[3], Ida Joseffson[7], Christian Kalus[1], Kerstin Kalus[1], Brian Kennedy[3], Dennis Nordlund[4], Michael Odelius[7], Wilson Quevedo[1], Ivan Rajkovic[2], Bill Schlotter[6], Mirko Scholz[2], Simon Schreck[1], Edlira Suljoti[1], Simone Techert[2], Josh Turner[6], Christian Weniger[1], Philippe Wernet[1], and Wenkai Zhang[5] — [1]Helmholtz-Zentrum Berlin, Berlin, Germany — [2]Max Planck Institute for Biophysical Chemistry, Göttingen, Germany — [3]MAX-lab, Lund, Sweden — [4]SSRL, SLAC National Accelerator Laboratory, Menlo Park, US — [5]PULSE, SLAC National Accelerator Laboratory, Menlo Park, US — [6]LCLS, SLAC National Accelerator Laboratory, Menlo Park, US — [7]Stockholm University, Stockholm, Sweden — [8]Utrecht University, Utrecht, Netherlands

The photodissociation reaction of $Fe(CO)_5$ solvated in ethanol was investigated in a pump-probe experiment with 300 fs time resolution. Resonant inelastic x-ray scattering (RIXS) and restricted active space self-consistent field (RASSCF) calculations enabled us to characterize low-lying excitations of parent $Fe(CO)_5$ molecules and $Fe(CO)_4$ photoproducts. The experiment was carried out at the Linac Coherent Light Source (LCLS) to utilize very intense tuneable soft x-ray pulses with femtosecond duration as required for a femtosecond RIXS experiment.