

Seminarvortrag am 08.03.2018, 10:00 Uhr, Bereich B

Few-cycle mid-wave infrared pulses via OPCPA and indirect pulse shaping

Laser sources in the mid-infrared are currently of increasing interest for a broad range of applications, including studies of fundamental properties of matter. This is enabled by a controlled generation of higher harmonics and hard x-rays. The availability of new and tailored nonlinear materials paves the way to apply the known method of optical parametric amplification to the efficient and broadband generation of intense few-cycle mid-infrared pulses.

In this talk, I will report on state of the art activities in this field. In particular, our concept of an advanced optical parametric chirped pulse amplification (OPCPA) system for around 5 μm is presented. First results indicate record short pulse durations at multi-GW peak power. 80 fs pulses were obtained by combining indirect signal pulse shaping with bulk material compression. In this configuration, a mid-infrared pulse shaper (LCoS-SLM) allows to carefully control the spectral phase of the idler pulse. The method has the potential to realize even higher repetition rates, to further increase the pulse energies and to generate sub-cycle pulses.