CFEL SCIENCE

SEMINAR

13th October 2015 - 10:00 h

CFEL – Building 99, seminar room I (ground floor)

Raffael Maurer

Photonics Institute, Vienna University of Technology, Vienna, Austria

Probing Stimulated Raman Scattering in Methane with lasing from a filament

We perform a proof-of-principle demonstration of chemically specific standoff gas sensing, in which a coherent stimulated Raman signal is detected in the direction anticollinear to a two-color laser excitation beam traversing the target volume. The proposed geometry is intrinsically free space as it does not involve back-scattering (reflection) of the signal or excitation beams at or behind the target. A beam carrying an intense mid-IR femtosecond (fs) pulse and a parametrically generated picosecond (ps) UV Stokes pulse is fired in the forward direction. A fs filament, produced by the intense mid-IR pulse, emits a backward-propagating narrowband ps laser pulse at the 337 and 357 nm transitions of excited molecular nitrogen, thus supplying a counter-propagating Raman pump pulse. The scheme is linearly sensitive to species concentration and provides both transverse and longitudinal spatial resolution.

Host: Jochen Küpper / CMI seminar