

Physikalisches Kolloquium



Thursday, 20.10.2022, 16:15, HS 100
In presence

Prof. Dr. Tobias Brixner, Julius-Maximilians-Universität Würzburg,
Lehrstuhl für Physikalische Chemie I:

Is High-Order Spectroscopy Useful?

Abstract

Linear spectroscopy is used routinely to characterize molecules and materials, and most time-resolved experiments are carried out in third-order response. Why bother with much more complicated experiments involving sequences of (many) femtosecond pulses and high nonlinear orders? Which types of additional information can be revealed? The perturbative series of the electromagnetic polarization is a very powerful theoretical concept but challenging to realize experimentally with high fidelity due to various artefacts and overlapping signal contributions. We have implemented methods to access the systematically increasing spectroscopic orders. Several applications will be discussed, focusing on multi-particle dynamics as shown in the figure. High-order spectroscopy allows one to systematically increase the number of interacting particles in complex systems, infer their interaction energies, and reconstruct their dynamics.

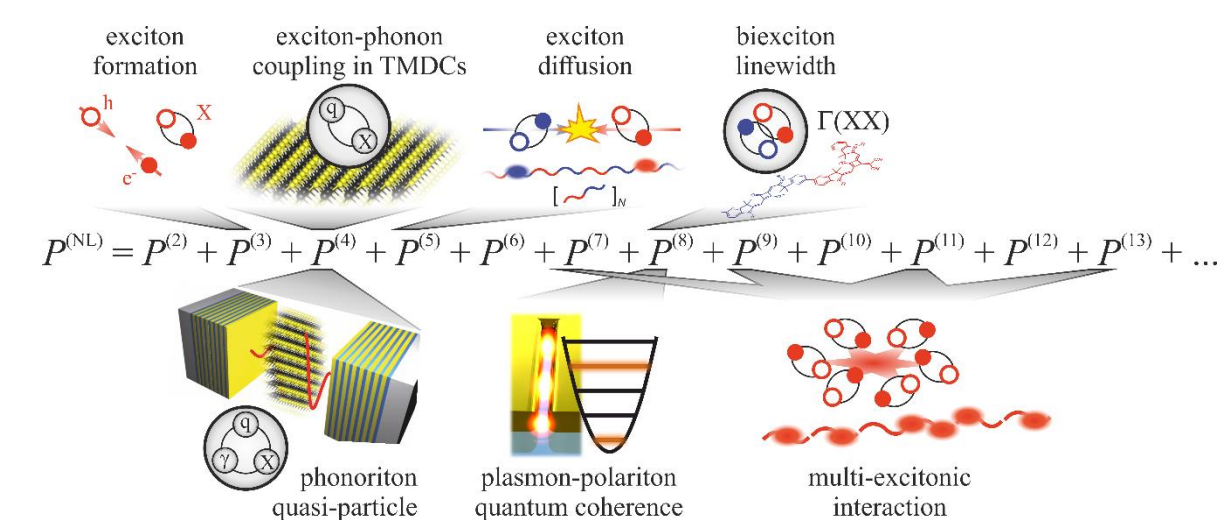


Photo: Experimental realization of the perturbative series of nonlinear polarization up to 13th order showcasing exemplary phenomena that we have investigated

All of you interested in physics are cordially invited!