

September 13, 2021 10:00 AM

QED & Materials seminar

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Title

“Electron Scattering and Static Field Effects in High-order Harmonic Generation in Solid Systems”

Abstract

High-order harmonic generation (HHG) is a strong nonlinear process which creates high-energy photons coherently from an input laser. HHG in gas systems has been widely studied and applied in attosecond science for decades and recently was adapted into solid systems. Our research in this talk was motivated by the needs to understand the underlying electronic dynamics of HHG in solid systems. Specifically, we have investigated the dynamics by considering the effects of scattering in solids and a static field based on semi-classical models. The results show the multi-plateau structure in HHG power spectra due to the scattering effect can be identified with a specific number of scattering by our extended semi-classical model. Also, it is shown the static field leads to a maximum photon energy for the HHG and the splitting of a plateau in the corresponding power spectrum. Before concluding, under the prospect of HHG utilizing free-electron laser, I will also present a preliminary examination on ab-initio simulations for HHG from the input of a soft X-ray.