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המכון למצב מוצק

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סמינר

Ultrafast generation and manipulation of slow electron wavepacket in time and energy

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Abstract

Coherent interactions of relativistic free electron wavepackets with strong optical fields is a cornerstone of recent light-matter interaction research. In my talk I will explore a new regime of electron-light interactions where the electrons are comparatively slow (~ 20 - 200 eV). First, we show that sub-optical-cycle electron bursts induced by tunneling photoemission from a metal nanotip can retain the temporal fingerprint of their emission dynamics [1]. In the second part, we consider a phase-matched interaction between a slow electron and a strong optical field. We find a strong tunable confinement of the electron spectrum, a new fundamental effect only accessible for slow electrons [2]. An appropriate choice of light field parameters can reduce the interaction dynamics to only two energy states. These combined capabilities expand the scope of electron beam physics, free-electron quantum optics and quantum simulators.

[1] M. Eldar et al., J. Phys.B 55, 074001 (2022); [2] M. Eldar et al., arXiv: 2209.14850

ההרצאה תתקיים ביום רביעי, ה-16.11.2022 בשעה 12:30

באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on **Wednesday, 16.11.2022 at 12:30
at the Solid State Institute auditorium, entrance floor**

**M.Sc. Student of Assistant Professor Michael Krüger
and Associate Professor Ido Kaminer**