

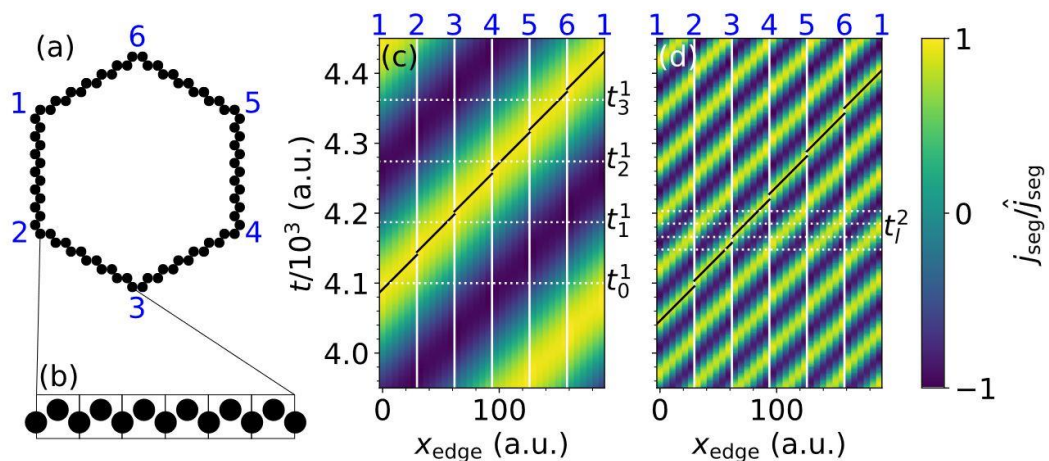
16th June 2022, 3:00 pm

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Quantum Theory & Many-Particle Systems

Contribution of edge-states to the high-order harmonic generation in topological insulators

Topological insulators are a special kind of solid state material. They are insulating in their interior but allow a dissipation-less electron movement along the edge or surface. The band structure usually has a well separated valence and conduction band with edge states connecting those two bands by a linear dispersion relation. The slope of the dispersion relation determines the group velocity of the electrons that move along the edge. In this work, the Haldane-model is used to simulate a topological insulator. This two-dimensional material is referred to as Haldanite. Its lattice has a honeycomb structure. An intense external laser field is applied to a finite Haldanite flake, which is shaped like a hexagon. The generation of high-harmonic radiation is simulated. The results are compared to the corresponding infinite material, i.e., the bulk of Haldanite. Some differences in the spectra originate from the edges of the finite flake. In fact, the spectra show a dependence on the size of the flake. Two peaks are observed in the spectra that shift in energy as the size of the flake changes. The energy of the peaks in the spectra can be predicted by the slope of the edge states in momentum space.



Talk: English

Slides: English

Location: Great Lecture Hall, HS1, Institute for Physics, Albert-Einstein Str. 24

Hybrid-Meeting: <https://uni-rostock-de.zoom.us/j/67191822515?pwd=UTVJSXVPaDVLV0ZSZW9LR3NRVWF2UT09>

