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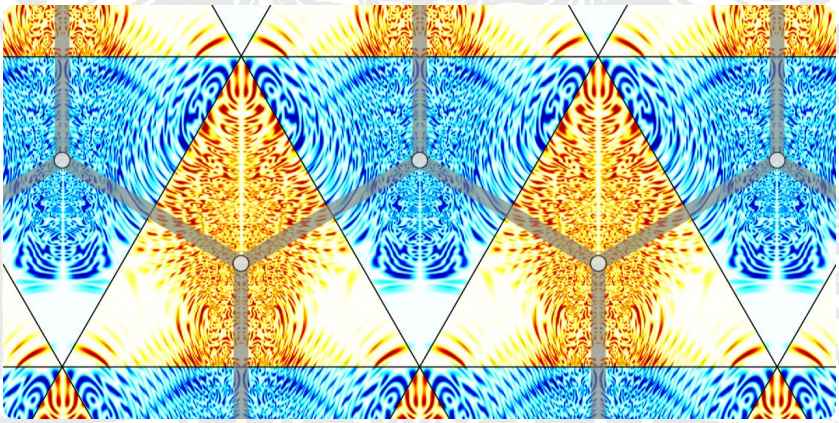

DYNAMICS OF DELOCALIZED ELECTRONS IN STRONG LASER FIELDS

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The dynamics of delocalized electrons in periodic or quasi-periodic environments is conveniently described in momentum space, where it couples to the vector potential of the laser field. In contrast to atoms and molecules, the spatial excursion which electrons execute in strong light fields known as quiver amplitude, does not seem to be important at first glance.

We will discuss two scenarios, where the quiver amplitude, that is the field strength and the frequency of the light, play a crucial role: (i) backscattering of delocalized electrons from domain boundaries and (ii) excitation and valley polarization in graphene, or more generally, in two dimensional systems with small gaps.