Seminar

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Abstract

In the initial part of the talk we shall present a novel topological lattice relying on a combination of a magnetic field gradient and a multi-frequency laser radiation propagating in a perpendicular direction. This creates effectively a square optical lattice affected by a non-staggered magnetic flux. By properly tuning the parameters of the system, the energy bands of the lattice can be characterized by unit Chern numbers [1]. Subsequently we shall discuss another possibility of producing topological optical lattices by using a set of long lived atomic internal states representing the sites in an extra (synthetic) dimension [2,3]. By taking the usual one-dimensional (1D) optical lattice and inducing laser-assisted transitions between the sites of the "extra dimension", one can effectively engineer a topological 2D lattice involving both real

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