

Seminar

Znanstvenog centra izvrsnosti
QuantiXLie i Fizičkog odsjeka

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Fibonacci anyon excitations of one-dimensional dipolar lattice bosons

We study a system of dipolar bosons in a one-dimensional optical lattice using exact diagonalization and density matrix renormalization group methods. In particular, we analyze low energy properties of the system at an average filling of $3/2$ atoms per lattice site. We identify the region of the parameter space where the system has non-Abelian Fibonacci anyon excitations that correspond to fractional domain walls between different charge-density-waves. When such one-dimensional systems are combined into a two-dimensional network, braiding of Fibonacci anyon excitations has potential application for fault tolerant, universal, topological quantum computation. Contrary to previous calculations, our results also demonstrate that super-solid phases are not present in the phase diagram for the discussed $3/2$ average filling. Instead, decreasing the value of the nearest-neighbor tunneling strength leads to a direct, Berezinskii-Kosterlitz-Thouless, superfluid to charge-density-wave quantum phase transition.

Petak, 2. ožujka 2018., 11h

Fizički odsjek, prostorija F-201 (2. kat)



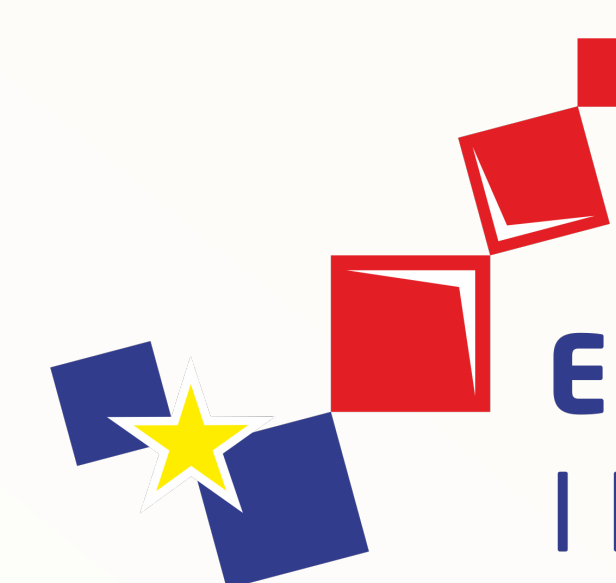
Znanstveni centar izvrsnosti
za kvantne i kompleksne sustave te
reprezentacije Liejevih algebri

Projekt KK.01.1.1.01.0004

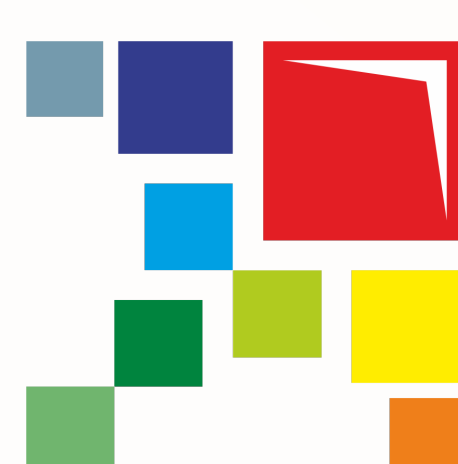
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Sadržaj ovog seminara isključiva je
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