



Sächsische  
Forschergruppe  
"From Local Constraints to  
Macroscopic Transport"

# Anomalous diffusion, ergodicity breaking and multifractality in optical lattices

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The transport of cold atoms in shallow optical lattices is characterized by power-law momentum distribution and slow, nonstationary momentum relaxation. We show that the latter can lead to nonergodic behavior and to anomalous spatial diffusion. We further derive a generalized Smoluchowski equation for the position variable and use it to analyze the multifractal properties of its moments.

9 April 2013  
15:30

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