M A T H E M A T I C A L P H Y S I C S S E M I N A R

Rutgers University
Hill Center - Room 705

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The semiclassical model for adiabatic slow-fast systems and the Hofstadter butterfly

Abstract

I present a simple but rigorous derivation of the semiclassical model for the slow degrees of freedom in an adiabatic slow-fast system. It is shown that it approximates stationary quantum mechanical expectations and the time-evolution of operators also in sub-leading order in the combined adiabatic and semiclassical limit. In solid state physics this semiclassical model was discovered first and has led to substantial progress during the recent years. As an illustration I discuss the orbital magnetization in the Hofstadter model and in graphene.