SFB 631

Festkörperbasierte Quanteninformationsverarbeitung

Seminar Announcement

Location University of Regensburg, Dept. of Physics
Room H 35

Time Thursday, 5th July 2007
2 p.m.

Speaker Dr. Vittorio Peano,
Physics Department, Heinrich-Heine Universität, Düsseldorf

Title Interplay of tunelling and dissipation in the Quantum Duffing oscillator

Abstract
We study the Duffing oscillator in the deep quantum regime. Starting from a solution of the coherent problem, we include the dissipative effects by means of a Floquet Born-Markovian master equation. Both analytical and numerical calculations reveal a rich phenomenology. Most interestingly, we find that (i) As the result of a complex interplay between tunelling and dissipation in correspondence to the multiphoton transitions, the oscillator displays alternatively a resonant and an antiresonant behaviour . Moreover, (ii) the dynamical bistability determines a separation of time scales. This phenomenon is suppressed by the multiphoton resonances. As a consequence, peaks in the quantum relaxation rate result. The formalism developed in this context is generalized to the bichromatic driven dissipative nonlinear oscillator.

Contact: Prof. Milena Grifoni, Phone 2035