Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

QE

Quantum Efficiency Seminar und Colloquium

GOVINDA CLOS

Physikalisches Institut
Albert-Ludwigs-Universität Freiburg

Non-Markovian Effects in the Dynamics of the Spin-Boson-Model

ABSTRACT: In the dynamics of an open quantum system, i.e., a system which interacts with an environment, memory effects can occur. This means that the future state of the system depends on the history of the system-environment interaction - this is non-Markovian behavior. Non-Markovianity is expected to be important in many chemical, biological, and physical processes; however, the concept, its causes, and its effect are not well understood so far.
In 2009 Breuer, Laine, and Piilo [1] made an important contribution to this task by giving a proper definition of quantum non-Markovianity and devising a measure to quantify its occurence.
In this talk, I want to present the application of this measure to the famous spin-boson-model. Quantifying the influence of non-Markovian effects depending on properties of the environment, one can get a better understanding of the model, the measure, and the mechanisms by which memory effects arise. With these findings, the role of the Markov approximation can be reviewed.

[1] H.-P. Breuer, E.-M. Laine, and J. Piilo, Phys. Rev. Lett. 103, 210401 (2009)

Date: **Tuesday, January 31st, 2012 14:15 pm**
Location: **Lecture Hall 1, Hermann-Herder-Str. 3, Freiburg**

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