Long time asymptotics for quantum Fokker-Planck models

TUE/E3.1
11:30–11:50

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Dissipative open quantum systems like quantum-Fokker-Planck models play an important role for quantum Brownian motion, quantum optics, and the numerical simulation of nano–semiconductor devices. Their time evolution can either be described by quantum kinetic Wigner function models or in the density matrix formalism.

We shall use tools from operator theory and quantum probability to establish the existence of a unique (normalized) steady state and convergence (in trace class norm). The proofs cover quadratic confinement potentials along with sub-quadratic perturbations [1]. Degenerate cases (i.e. equality in the so called Lindblad–condition for complete positivity) turn out to be delicate and will be discussed if time allows [2].

[1] A. ARNOLD, F. FAGNOLA, L. NEUMANN: Quantum Fokker-Planck models: the Lindblad and Wigner approaches. In: *Quantum Probability and related Topics - Proceedings of the 28th Conference* (Series: QP-PQ: Quantum Probability and White Noise Analysis - Vol. 23), J.C. García, R. Quezada, S.B. Sontz (Eds.), World Scientific 2008, pp. 23–48.

[2] F. FAGNOLA, L. NEUMANN: Quantum Fokker-Planck models: Limiting case in the Lindblad Condition. submitted