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Bulinskij, Andrej, Moscow Institute of Physics and Technology, Russia

On dynamical semigroups compatible with states of von Neumann algebras

Large time asymptotics is studied for semigroups τ of completely positive mappings $(\tau_t)_{t\geq 0} \subset \mathcal{L}(\mathcal{M})$ of a W^*-algebra $\mathcal{M}$ which model evolution of open quantum systems in the Markovian approximation. We consider mainly the (classes of cocyclic conjugacy of) semigroups τ having a stationary faithful state $\omega \in \mathcal{M}_*$ and commuting with the modular automorphisms group σ^ω. The ergodic properties of the semigroups induced in spaces $L^p(\mathcal{M}, \omega)$ are compared to those of the corresponding semigroups on $\mathcal{M}_*$ and $\mathcal{M}'$ in $\mathcal{H} = L^2(\mathcal{M}, \omega)$ and of their dilations and regular extension to $\mathcal{B}(\mathcal{H})$ to establish some scattering theory structures. The quasi-free evolutions τ related to non-Fock representations of the CAR-algebra are treated in detail, including the index and entropy.