

Construction of KMS Dirichlet forms and superbounded markovian semigroups on von Neumann algebras

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We introduce a construction of Dirichlet forms on von Neumann algebras M associated to any eigenvalue of the Araki modular Hamiltonian of a f. n. non-tracial state, providing also conditions by which the associated Markovian semigroups are GNS symmetric. The structure of these Dirichlet forms is described in terms of unbounded spatial derivations, coercivity bounds are proved and the spectral growth is derived.

We then introduce superboundedness of positivity preserving semigroups, in terms of the symmetric embedding of M into its standard space.

These tools are applied to a general construction of the quantum Ornstein–Uhlenbeck semigroups of the Canonical Commutation Relations CCR and some of their non-perturbative deformations.

Orateur: CIPRIANI, Fabio (Politecnico Milano)