

STATISZTIKUS FIZIKA SZEMINÁRIUMOK

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Wigner RMI

Generalized quantum Zeno dynamics and ergodic means

We prove the existence of uniform limits for certain sequences of products of contractions and elements of uniformly continuous propagators acting on a Hilbert or a Banach space. From the point of view of Quantum Physics, the considered sequences can represent the evolution of a system whose dynamics, described by a continuous propagator, is disturbed by a sequence of generic quantum operations (e.g., projective measurements or unitary pulses). This includes and also generalizes the so-called quantum Zeno dynamics. The time-evolution obtained from the limits of the considered sequences are described by propagators generated by ergodic mean operators. The notion of such ergodic mean operators is generalized in this paper to also include propagators of time-dependent generators, and thus our results can be used to develop new forms of active decoherence suppression. For time independent, hamiltonian generators of finitely many spectral points, we prove exponentially improved error bounds on the convergence of the aforementioned products.

Joint work with Norbert Barankai (MTA-ELTE Theoretical Physics Research Group).

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