TEMPORAL NONLOCALITY IN QUANTUM DYNAMICS

R. Hilfer[1]

(1) ICP, Universität Stuttgart, 70569 Stuttgart, Germany

The mathematical analysis of quantum many body systems requires the study of long time limits. This work discusses the interdisciplinary problem of local stationarity in time. A mathematical definition of almost invariant and nearly indistinguishable states on C*-algebras is introduced. It is based on functions of bounded mean oscillation [1]. Rescaling of time yields generalized time flows of almost invariant and macroscopically indistinguishable states, that are mathematically related to stable convolution semigroups. The infinitesimal generator of coarse grained semigroups are operators that are nonlocal in time [2]. Applications of the analysis are given to irreversibility and experiment.

[1] R. Hilfer, Mathematics **3**, 626 (2015).

[2] R. Hilfer, Analysis **36**, 49 (2016).