

Mini-Workshop:

Product Systems and Independence in Quantum Dynamics

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Organizers:

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ABSTRACT

Quantum dynamics, both reversible (i.e., closed quantum systems) and irreversible (i.e., open quantum systems), gives rise to product systems of Hilbert spaces or, more generally, of Hilbert modules. When we consider reversible dynamics that *dilates* an irreversible dynamics, then the product system of the latter is equal to the product system of the former (or is contained in a unique way). Whenever the dynamics is on a proper subalgebra of the algebra of all bounded operators on a Hilbert space, in particular, when the open system is classical (commutative) it is indispensable that we use Hilbert modules.

The product system of a reversible dynamics is intimately related to a filtration of subalgebras that are independent in a state or conditionally independent in a conditional expectation of the reversible system. This has been illustrated in many concrete dilations that have been obtained with the help of quantum stochastic calculus. Here the underlying Fock space or module determines the sort of quantum independence underlying the reversible system.

We wish to bring together experts from quantum dynamics, product systems and quantum independence who have contributed to the general theory or who have studied intriguing examples. As the implications of the tight relationship between product systems and independence have so far been largely neglected, we expect from our mini-workshop a strong innovative impulse to this field.

More information can be found at:

<http://www.math-inf.uni-greifswald.de/algebra/q-dyn/>