

E-semigroups, product systems and dilation theory

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Abstract: E-semigroups are semigroups of endomorphisms of the algebra of all bounded operators on a Hilbert space (or of a general von Neumann algebra). Associated with any such E-semigroup is a tensor product system of Hilbert spaces. E-semigroups can be classified up to cocycle conjugacy through product systems. Product systems have been broadly classified into three types. Non type-I examples were hard to come by, but now we have a plenty of such examples, though we hardly understand them. One may realize E semigroups through dilations of quantum dynamical semigroups. It can be shown that dilations of quantum dynamical semigroups with bounded generators are type I.