SPECTRAL REPRESENTATION OF LOCAL SYMMETRIC SEMIGROUPS OF OPERATORS OVER TOPOLOGICAL GROUPS

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Abstract. We consider local symmetric semigroups of Hilbert space operators. For an open semigroup $\mathfrak{S}$ in some topological group and a dense subsemigroup $\mathfrak{S}'$ of $\mathfrak{S}$, these are semigroups of unbounded selfadjoint operators $(H(t))_{t\in\mathfrak{S}'}$ that admit local continuous extensions to open subsets of $\mathfrak{S}$. We study the possibility to continuously extend $H(\cdot)$ to a semigroup of selfadjoint operators defined for all $t \in \mathfrak{S}$ in several settings. Integral representation formulae for the extended semigroups $(H(t))_{t\in\mathfrak{S}}$ by means of real characters of $\mathfrak{S}$ are established. Our proofs rely on graph limits of selfadjoint operators, commutativity of unbounded operators and semigroup techniques, among others.

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