



Minisymposium 15 - Operatortheorie

Perturbation theory of semi-groups and evolution equations

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The aim of the present talk is to develop an approach to the Cauchy problem for linear evolution equations of type

$$\frac{\partial}{\partial t}u(t) + A(t)u(t) = 0, \quad u(s) = u_s, \quad a < s \leq t < b,$$

on a separable Banach space X , where (a, b) is a finite open interval and $\{A(t)\}_{t \in (a, b)}$ is a family of closed linear operators on the separable Banach space X . The main question concerning the Cauchy problem is to find a so-called “solution operator” or propagator $U(t, s)$. We are going to solve this problem embedding it into a perturbation problem for generators of semi-groups in the Banach space $L^p([0, T], X)$, $1 < p < \infty$. The abstract existence results are applied to Schrödinger operators with time-dependent point interactions.