

Operator splitting for evolution equations

A. Bátkai

Operator splitting is a widely used method of numerical analysis based on the Lie-Trotter product formula

$$\left(e^{\frac{t}{n}A} e^{\frac{t}{n}B} \right)^n \rightarrow e^{t(A+B)}. \quad (1)$$

The idea is to decompose complicated operators into simpler ones and then use this to approximate the solutions of the corresponding Cauchy problem. In the talk we present a general abstract framework and present a list of examples (e.g., nonautonomous equations, abstract boundary value problems, inhomogeneous problems, semigroups associated to admissible control and observation systems, etc.) where the abstract theory can be applied. Joint work with P. Csomós, K.-J. Engel, B. Farkas and G. Nickel. Supported by the Alexander von Humboldt-Stiftung.