

## LOCAL PROPAGATOR THEORY

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**ABSTRACT.** A survey of abstract propagator theory (Ovcyannikov or Ovsjannikov Theorem) is given. This theory is reminiscent of semigroup theory. However, while semigroup theory is appropriate to the study of well posed initial value problems, abstract propagator theory is most appropriate to the study of (so called) ill posed initial value problems. A list of elementary ill posed problems is presented and references to deeper and more difficult problems are given.

Next, an exposition of the basic abstract structure and elementary linear theory along with some elementary examples is given. This is followed by a survey of the most recent linear theory, nonlinear theory, and applications.

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**I. Elementary Theory. 0. Introduction.** In this paper we shall describe an abstract theory which is useful in studying various initial value problems for partial differential equations. The theory involves the solvability of an abstract initial value problem in a continuous family (usually called a scale) or sequence of Banach spaces. The results are usually referred to as the Ovcyannikov (or Ovsjannikov) theory or as an Abstract Cauchy-