

A short introduction to splitting methods for differential equations

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Abstract

Splitting methods constitute a powerful tool for the numerical integration of differential equations, either arising directly from dynamical systems or from partial differential equations of evolution previously discretized in space. Efficient high-order schemes have been designed that provide accurate solutions whilst preserving some of the most salient qualitative features of the system.

In this talk we present an overview of this type of schemes and some of their applications. We will also consider a new class of reversible splitting methods and analyze their preservation properties when they are applied to the integration of unitary problems.