

# Some high-order Taylor-models based methods for solving PDEs

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## **Abstract**

We present three different approaches to solving PDEs based Taylor-models. In each approach we stress a high accuracy which can be achieved with a grid of relatively low-order Taylor polynomials. In particular, in solving Dirichlet boundary problem for the Laplace equation with the grid of step  $h$  of quadratic Taylor polynomials we get the discretization error of order  $h^{10}$ . Similar results are obtained for evolution equations, with and without time discretization. We study the stability of the resulting schemes and present some numerical examples.