

Numerical solution of ODE-s

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ABSTRACT

- Basic methods for numerical solution of initial value problems
 - convergence and stability
 - stiff equations
- Solution of boundary value problems
 - summary of known methods (shooting, finite differences, spectral)
 - some properties of the shooting method
- Singularity at the boundary (solving the Laplacian equation with the assumption of spherical or cylindrical symmetry: $1/r$ type singularity at the origin and $\exp(-r)$ type singularity at infinity).

References:

- Stoyan - Takó: Numerikus módszerek I-III., TypoTeX
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- Uri Ascher, Bob Mattheij and Bob Russell, Numerical Solution of Boundary Value Problems for Ordinary Differential Equations, SIAM Classics, 1995.
- J. Stoer - R. Bulirsch: Introduction to Numerical Analysis, Springer, 1993