November 15, 2016

ODEs

In this class you should learn:

- *(Review) a few common ODE models and how we state them in a general framework.*

- *How we can compute a one-step approximation based on finite difference schemes.*

- *How a small set of topics allow us to understand what is going on with an approximate solution to an ODE*

Next class
Stiff ODEs
Section 11.4, 11.4.1, 11.4.2

Next next class
2-point BVPs and PDEs
Chapter 13, 14 (first sections)

Outline of topics for ODEs

Today Section 11.1, 11.2.1, 11.2.4, 11.2.5, 11.2.6, 11.2.7

Fundamental definitions of ODE solvers

Friday Stiff ODEs and absolute stability (11.4), and backward Euler.

Monday BVPs and PDEs (Chapter 13, 14)

Learning goals

Understand how to use discretization methods on ODEs and study their properties.

    Forward Euler

    Backwards Euler

Understand absolute stability

Know how to use some ODE tools (e.g. Julia/Matlab))

Understand how these ODE methods relate to PDE and BVP methods.