

Predictor-corrector solver for ODE

Using Predictor-corrector solvers for 2- and 3- body problems

Severin Denisenko

October 8, 2024

Saint Petersburg State University

1. Concept
2. Interpolatin Adams method

Concept

For predictor-corrector required:

- First explicit method (predictor)
- Second implicit method (corrector)
- Predictor-corrector scheme (explained next)

- Using the outcome of the explicit (predictor) method as an initial guess for the corrector (implicit) method
- Using the predictor result as a beginning value in an iterative substitution in implicit method

Predictor-corrector order of approximation

- Interpolation Adams method has $+1$ order of approximation of interpolation Adams method
- Adams interpolation and extrapolation methods can be used as a predictor-corrector pair
- Resulting predictor-corrector method will give interpolation's method approximation

Interpolatin Adams method

Second order

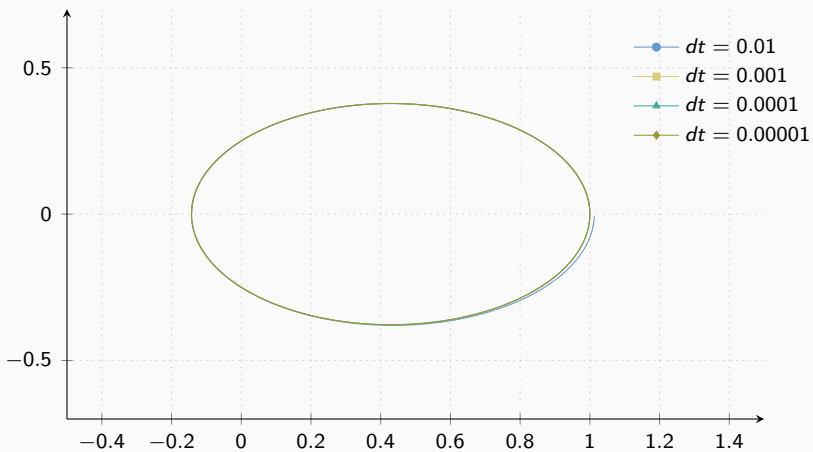


Table 1: Second order method precision

dt	x on $t=T$
0.01	1.01271285286200
0.001	1.00001246611392
0.0001	1.00000001277170
0.00001	1.000000000000627
exact	1.0

