Runge-Kutta Methods for Differential Equations with Distributed Delays

A.S. Eremin

Department of Information Systems, St.-Petersburg State University, 35
Universitetskii pr., St.-Petersburg, Russia 198504

`a.eremin@spbu.ru`

Abstract

An attempt to construct fast Runge-Kutta methods for delay differential equations with distributed delays is made. As a starting point functional continuous methods for general retarded functional differential equations are considered. New explicit methods of order three and four are constructed, which are more effective than functional continuous Runge-Kutta methods of the same order. Numerical tests confirm the convergence order of the new methods. Comparison to closely related Runge-Kutta methods for Volterra integro-differential equations is made.