

Butcher Algebras

Sergei Khashin (Ivanovo State University)

Runge-Kutta methods of orders up to 7 are well known. However, there are problems that require very high accuracy, and, therefore, they require Runge-Kutta methods of higher orders.

We suggest an idea how we can structure Butcher equations from the point of view of Abstract Algebra. As the result the system can be significantly simplified, and some new Runge-Kutta methods of orders 9 have been obtained.