

Embedded singly diagonally implicit Runge-Kutta methods (4,5) in (5,6). For the integration of stiff systems of ODEs

ABSTRACT

In this paper, fourth order, five-stage embedded in fifth order six-stage Singly Diagonally Implicit Runge-Kutta (SDIRK) methods are derived, and their regions of stability are determined. Numerical results of these methods are presented and compared with the results obtained when the same systems are solved using Rabeh's third order three-stage embedded in fourth order four-stage SDIRK method. Also presented are the stability regions of the methods.

Keyword: Singly diagonally implicit Runge-Kutta methods; Embedded Runge-Kutta method; Stiff ordinary differential equations