

## A Method for Improving the Embedded Runge Kutta Fehlberg 4(5)

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**Abstract :** In this paper, we introduce a method for improving the embedded Runge-Kutta-Fehlberg 4(5) method. At each integration step, the proposed method is comprised of two equations for the solution and the error, respectively. This solution and error are obtained by solving an initial value problem whose solution has the information of the error at each integration step. The constructed algorithm controls both the error and the time step size simultaneously and possesses a good performance in the computational cost compared to the original method. For the assessment of the effectiveness, EULR problem is numerically solved.

**Keywords :** embedded Runge-Kutta-Fehlberg method, initial value problem, EULR problem, integration step

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