

## An Efficient Algorithm of Time Step Control for Error Correction Method

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**Abstract :** The aim of this paper is to construct an algorithm of time step control for the error correction method most recently developed by one of the authors for solving stiff initial value problems. It is achieved with the generalized Chebyshev polynomial and the corresponding error correction method. The main idea of the proposed scheme is in the usage of the duplicated node points in the generalized Chebyshev polynomials of two different degrees by adding necessary sample points instead of re-sampling all points. At each integration step, the proposed method is comprised of two equations for the solution and the error, respectively. 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. Two stiff problems are numerically solved to assess the effectiveness of the proposed scheme.

**Keywords :** stiff initial value problem, error correction method, generalized Chebyshev polynomial, node points

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