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A new piecewise spectral homotopy analysis of the Michaelis-Menten enzymatic reactions model. (English) [Zbl 1296.65099](#)

Numer. Algorithms 66, No. 3, 495-510 (2014).

Summary: In this paper we report on a novel method for solving systems of nonlinear differential equations which is an extension of the spectral homotopy analysis method (SHAM). The proposed method extends the application of the SHAM to initial value problems that model the Michaelis-Menten enzymatic reaction equation. Results from the proposed method are compared with Runge-Kutta routines as a measure of accuracy and efficiency.

MSC:

[65L05](#) Numerical methods for initial value problems

[34A34](#) Nonlinear ordinary differential equations and systems, general theory

[65L60](#) Finite element, Rayleigh-Ritz, Galerkin and collocation methods for ordinary differential equations

[92E20](#) Classical flows, reactions, etc. in chemistry

Cited in 4 Documents

Keywords:

piecewise spectral homotopy analysis; Michaelis-Menten enzymatic reactions; numerical examples; comparison of methods; systems of nonlinear differential equations; spectral homotopy analysis method; Runge-Kutta routines

Software:

ISHAM; Matlab

Full Text: [DOI](#)

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