Hernández, M. A.; Rubio, M. J.; Ezquerro, J. A.
Solving a special case of conservative problems by secant-like methods. (English)
Zbl 1080.65044

For nonlinear operator equations in Banach space the authors consider a relaxed form of a general secant method. Convergence is proved and a priori error bounds are obtained by means of the type of recurrence relations used by J. M. Gutiérrez and M. A. Hernández [Appl. Math. Lett. 10, 63-65 (1997; Zbl 0883.65050)] for Chebyshev’s method. The results are applied to conservative systems of the form \( \ddot{x} + \Phi(x(t)) = 0, \ x(0) = x(1) = 0 \).

Reviewer: W. C. Rheinboldt (Pittsburgh)

MSC:
65J15 Numerical solutions to equations with nonlinear operators
47J25 Iterative procedures involving nonlinear operators
65L10 Numerical solution of boundary value problems involving ordinary differential equations
34B15 Nonlinear boundary value problems for ordinary differential equations

Keywords:
secant method; convergence; recurrence relations; boundary value problems; nonlinear operator equations; Banach space; a priori error bounds; Chebyshev’s method

Full Text: DOI

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