Hiegemann, M.

The article deals with a method to handle integrated forms of linear ordinary differential equations. The application of this method leads to linear algebraic systems which can be solved by iterative methods. Algorithms are based on the theory of Chebyshev expansions and matrix operator expressions. The application is demonstrated by two examples. Furthermore, the method is extended to linear parabolic problems. Finally, the application to eigenvalue problems is explained by means of the Orr-Sommerfeld equation.

Reviewer: S.Yanchuk (Kiev)

MSC:
65L05 Numerical methods for initial value problems involving ordinary differential equations
35K15 Initial value problems for second-order parabolic equations
65L15 Numerical solution of eigenvalue problems involving ordinary differential equations
34A30 Linear ordinary differential equations and systems
34L15 Eigenvalues, estimation of eigenvalues, upper and lower bounds of ordinary differential operators

Keywords: integrated form; Chebyshev polynomials; Chebyshev expansions; spectral matrix; iterative methods; eigenvalue problem; Orr-Sommerfeld equation

Full Text: DOI

References:

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original...
paper as accurately as possible without claiming the completeness or perfect precision of the matching.