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An Accelerated Bisection Method for the Calculation of Eigenvalues of a Symmetric Tridiagonal Matrix (Classic Reprint)

By Herbert J Bernstein

Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from An Accelerated Bisection Method for the Calculation of Eigenvalues of a Symmetric Tridiagonal Matrix Summary. We present a method for the determination of eigenvalues of a symmetric tridiagonal matrix which combines Givens Sturn bisection [4, 5] with interpolation, to accelerate convergence in high precision cases. By using an appropriate root of the absolute value of the determinant to derive the interpolation weight, results are obtained which compare favorably with the Barth, Martin, Wilkinson algorithm [1]. Subject Classifications: AMS (MOS): 15A18, 15-04, 65F10; CR: 5.14 1. Introduction When a modest subset of the eigenvalues of a symmetric tridiagonal matrix is required, the most effective technique available is the bisection method presented by Givens [4, 5]. As Wilkinson [6] notes, once an eigenvalue is approximately located, final convergence by interpolation may be more economical than continued bisection. However, in the case of repeated or clustered eigenvalues, interpolation is likely to be more expensive than bisection. Distinguishing the isolated eigenvalues from the repeated ones can often require more code and time than completion of the bisection. Indeed, many...



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