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解大型结构特征值问题的同时迭代的一个新算法

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A NEW SIMULTANEOUS ITERATION ALGORITHM FOR EVALUATION OF EIGENPROBLEMS IN LARGE STRUCTURES

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摘要

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摘要 本文提出了同时迭代法的一种变型算法,用来求解大型结构动力分析中的广义特征值问题。使用了E_k子空间和特征方向的概念,证明了该算法的收敛率,并讨论了如何在计算机上实现的某些细节问题。通过统计每步迭代所需运算量和大量的实际计算,表明该算法与当前几种常用的同时迭代法或子空间迭代法相比,收敛率相同,但减少了每步迭代所需的计算量,提高了计算效率。

关键词:

Abstract: A new improved algorithm of simultaneous iteration is presented for evaluation of generalized eigenproblems in dynamic analysis of large structures. The convergence of this algorithm is proved by the concepts of EK subspace and eigendirection and some details of how to perform this algorithm in computer are discussed. Based on statistics of computational quantity required for each step of iteration and a great number of practical computations, it is shown that in convergence rate the present method is comparable to some simultaneous or subspace iteration algorithms available up to now, but it can cut down the computer run time for each step of iteration and raise the computation efficiency.

Keywords:

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