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论文

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特征向量导数的简便算法

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A SIMPLIFIED METHOD FOR CALCULATING EIGENVECTOR DERIVATIVES

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摘要

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摘要 一、前言 在结构动稳定或动响应的优化设计中,结构的固有频率(其平方称特征值)和固有振型(又称特征向量)常常是约束函数的一部分,如果能求出这些函数的变化率,则通常能采用更有效的须用导数的优化方法。Fox和Kapoor首次关于对称矩阵推导了特征向量一阶导数,Rogers,Plaut和Huseyin,钟万勰和程耿东等把这个研究推

关键词:

Abstract: A simplified method is presented for the determination of the first-and second-order and higher order derivatives of eigenvectors. In the procedure, by using the normalization condition of eigenvectors, the matrix of the original eigensystem of rank $(n-1)$ is modified directly to be a matrix of rank n . Then the derivatives of eigenvectors are solved directly by using LU decomposition-bank-substitution method. Examples show that the calculated results of the present method are the same as that of Nelson's method. However, this method is more concise in conception and simpler than Nelson's method. In addition, the second, and higher order derivatives of the eigenvectors can also be solved.

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