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在MIMD型机上求解板的临界载荷的一种并行算法

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A PARALLEL ALGORITHM ON THE MIMD FOR THE CALCULATION OF BUCKLING LOADS OF THE PLATE

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摘要

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摘要 提出了一种在MIMD型并行机上求解板的临界载荷的子结构方法的并行算法。此算法实际上就是解决 $Ax = \lambda Bx$ 广义特征值问题(其中A、B为正定的箭头型矩阵)。主要通过矩阵变换将此问题转化成适合并行算法的一般特征值问题。给出了此并行算法的并行加速及效率的分析和算例,证明了此并行算法的优越性。

关键词: 并行处理 本征矢量 同余 矩阵法

Abstract: A parallel algorithm is presented which is based on the substructure technique of the finite element method for determining the critical loads of thin elastic plates. The single path subdivision approach is used for the numbering of the nodes of the finite element mesh; therefore the doubly bordered band form of the stiffness matrices can be obtained. By using a congruence transformation, an equivalent mathematical model of the generalized eigenvalue problem is established to fit the parallel processing for calculating the critical loads of the plate stability problem. The criterion for the evaluation of the speed-up of the parallel computation is given. Numerical analyses have been performed to illustrate the efficiency and the advantages of the parallel processing on Multi-Transputer System.

Keywords: parallel processing (computers) eigenvalues congruences matrix methods

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