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二维任意域内基于节点的局部网格生成算法

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Node-Based Local Mesh Generation Algorithm Within an Arbitrary 2D Domain

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摘要 凸域内基于节点的局部网格生成算法,克服了基于节点的有限元方法的网格生成可能产生的不一致性。将该基于节点的局部网格生成算法的适用范围拓展到二维任意域。另外,提出了通过使用约束Delaunay路径来划分任意域的区域划分算法,该算法使得在并行实现网格生成的过程中各处理器之间无需通信,从而大大提高了节点给定情形下有限元方法网格生成的并行效率。

关键词: 任意域　约束Delaunay路径　不一致性　基于节点的局部网格　区域划分算法

Abstract： A new node-based local mesh generation (NLMG) algorithm within a 2D convex domain designed for the node-based finite element method can circumvent the so-called inconsistency phenomenon. In this paper, the node-based local mesh generation algorithm is extended so that it can be applied to the 2D arbitrary domain. In addition, a new 2D arbitrary domain partition algorithm by means of searching constrained Delaunay path is proposed, which keeps the distributed processors free of communication during the process of parallel mesh generation. Thus, the enhanced parallel efficiency of mesh generation algorithm for the finite element method in the case of given nodes is achieved.

Keywords： arbitrary domain　constrained Delaunay path　inconsistency　node-based local mesh　domain partition algorithm

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引用本文:

常升;聂玉峰. 二维任意域内基于节点的局部网格生成算法[J]. 航空学报, 2005, 26(5): 540-545.

CHANG Sheng;NIE Yu-feng. Node-Based Local Mesh Generation Algorithm Within an Arbitrary 2D Domain[J]. Acta Aeronautica et Astronautica Sinica, 2005, 26(5): 540-545.