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Kriging插值无网格方法及其在力学边值问题中的应用

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收稿日期 2005-12-2 修回日期 2006-1-20 网络版发布日期 2007-1-16 接受日期 2005-12-2

摘要 在传统的无网格Galerkin法中, 采用滑动Kriging插值方法构造形函数, 并与无网格方法相结合建立一种新的无网格方法。依此方法所构造的形函数具有Kronecker δ -函数属性, 便于直接施加强制边界条件。结合弹性力学边值问题, 阐述该方法的基本原理, 进而通过算例计算与分析, 考察该方法的计算精度及其效率。

关键词 [数值分析](#); [无网格方法](#); [Kriging插值](#); [Kronecker d-函数属性](#)

分类号

A NEW-TYPE ELEMENT-FREE METHOD BASED ON KRIGING INTERPOLATION SCHEME AND ITS APPLICATION TO SOLVING BOUNDARY-VALUE PROBLEM OF MECHANICS

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Abstract

Presented in this paper is a new formulation of the element-free Galerkin method for the boundary-value problems of solid mechanics in which the moving Kriging interpolation procedure is employed instead of moving least squared procedure to construct shape function. The proposed procedure is characterized by the feature that the shape function constructed by moving Kriging procedure possess the property of Kronecker δ -function and the consistency property. At the same time, the specified essential boundary conditions can be easily implemented while displacement boundary conditions are not easily imposed in the conventional element-free methods. The fundamental theory of this procedure is illustrated; and mathematical formulations are given. Then numerical examples are analyzed by the proposed procedure; and the computed results are compared with other solutions to verify the effectiveness and accuracy of the proposed method.

Key words [numerical analysis](#); [element-free method](#); [Kriging interpolation](#); [property of Kronecker \$\delta\$ -function](#)

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