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薄板弯曲问题的Trefftz方法

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TREFFTZ METHOD FOR THIN PLATE BENDING PROBLEMS

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摘要

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摘要 本文从弹性力学广义变分原理出发,提出了一种求解薄板弯曲问题的Trefftz方法。为了让近似函数满足平衡微分方程,利用复变函数理论研究了试函数空间的构造问题。最后对矩形板给出了3个算例,计算结果表明该方法具有较好的收敛性和稳定性。

关键词: 广义变分原理 双调和函数 Trefftz方法 薄板弯曲

Abstract: From the generalized variational principles of plate bending problems, a variational equation is established in which the coordinate function satisfies the biharmonic equation within the region exactly. According to the functional theory of a complex variable, the trial function space is also constructed by using the series of biharmonic polynomials, thus the so-called Trefftz method for thin plate bending problems is proposed, whose feature is that the unknown parameters are evaluated in the manner that approximately satisfies the whole boundary conditions. Three examples for the rectangular plate are presented, which show the high convergence and accuracy of the solutions not only within the region but also on the boundaries and at the corners.

Keywords: generalized variational principle biharmonic function trefftz method thin plate bending problems

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