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非线性区间迭代法在结构后屈曲分析中的应用

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APPLICATION OF NONLINEAR INTERVAL ITERATION METHOD TO POST BUCKLING ANALYSIS OF STRUCTURES

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摘要

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摘要 使用区间迭代法跟踪结构后屈曲平衡路径。区间迭代法可以在接近临界载荷处自动解出屈曲前和屈曲后的两个可能平衡位形, 从而避免了由于刚度矩阵奇异而使迭代停止的数值困难。一些典型例题的数值解, 证明了非线性区间迭代法可以穿过极值点, 并能追踪到极值点之后的解曲线, 而且对所谓“位移回弹”(Snap back)问题, 区间迭代法仍然是有效的。

关键词: 区间迭代法 后屈曲 非线性

Abstract: A non linear interval iteration method is applied to trace the post buckling equilibrium path of structures. Two equilibrium configurations of pre buckling and post buckling near critical loads have been obtained automatically, which avoids stopping of iteration resulting from singularity of stiffness matrixes. Some typical numerical examples show that the method can go through limit points and trace the equilibrium path of post buckling. While dealing with the so called snap back problems, the method is especially effective.

Keywords: interval iteration method post-buckling non-linearity

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