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### 材料非线性有限元分析的一种有效方法——预测割线刚度变刚法

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### AN EFFECTIVE SOLUTION PROCEDURE OF FEM FOR MATERIAL NONLINEAR ANALYSIS——PREDICTED SECON T STIFFNESS PROCEDURE

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摘要

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**摘要** 材料非线性有限元增量解法中如何减少加载次数,保证精度是两个重要的问题;而误差估计也是与之密切相关的问题,特别是对每次加载不进行迭代的增量变刚法。本文针对这些问题提出预测割线刚度变刚法。

**关键词:**

**Abstract:** In this paper, a solution procedure of the finite element incremental analysis for material nonlinear problems is presented. The procedure includes the predicted secont stiffness constitutive relations, Bergan's method regarding automatic selection of load increments and the evaluation of the results obtained. Then two numerical examples of thick-wall cylinders with perfectly plastic and power strain-hardening materials are given and comparisions are made among the theoretical results and the results from the first order self-correcting procedure, Chang's predictor-corrector procedire with asymptotic integration of elastoplastic constitutive relations and the predicted secont stiffness procedure. The results show that the procedure in this paper can improve the computational precisi onand/or the computational efficeince, and has the same function of self-correcting as the first order self-correcting procedure does. Finaly suggestions are made that the ideas in the paper may be used for BEM and asymptotic integration procedure for elastoplastic incremental analyses in which linearized stress-strain curves are assumed.

**Keywords:**

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