岩石力学与工程学报 2005 24 (01): 13 ISSN: 1000-6915 CN: 42-1397/O3

地下工程锚固岩体有限元分析的并行计算

茹忠亮1，冯夏庭1，2，张友良2，姜谙男1

(1. 东北大学 资源与土木工程学院，辽宁 沈阳 110004；2. 中国科学院 武汉岩土力学研究所岩土力学重点实验室，湖北 武汉 430071)

收稿日期 2004-2-27 修回日期 2004-3-29 网络版发布日期 2007-2-5 接受日期 2004-2-27

摘要 了解决当前大型岩土工程单机计算困难、计算时间长、精度低的问题，在弹塑性有限元串行算法的基础上，提出了考虑岩体锚固问题的弹塑性并行算法，用VC++6.0开发了基于Windows操作系统的并行有限元计算程序，实现了数据的分布式存储和计算，并在计算机集群(COW)上成功地对水布垭尾水洞洞室支护进行了并行有限元计算分析。与单机串行算法相比，较大程度地减少了计算时间，提高了计算效率。

关键词 岩石力学；并行有限元法；锚固岩体；弹塑性分析

分类号

PARALLEL FINITE ELEMENT METHOD ANALYSIS OF BOLTED ROCK MASS IN UNDERGROUND ENGINEERING

RU Zhong-liang1，FENG Xia-ting1，2，ZHANG You-liang2，JIANG An-nan1

(1. School of Resources and Civil Engineering，Northeastern University，Shenyang 110004，China；
2. Key Laboratory of Rock and Soil Mechanics，Institute of Rock and Soil Mechanics，The Chinese Academy of Sciences，
Wuhan 430071，China)

Abstract

There are many problems in analyzing the large-scale geotechnical engineering by finite element method(FEM)：the memory restriction，long computing time and low precision and etc.. For solving these problems，this paper proposes the parallel algorithm of elasto-plastic finite element method (FEM) for bolted rock mass，develops the program in VC++6.0 based on Windows operating system，and carries out the analysis of supporting system of tunnels in the Shuibuya hydropower project on cluster of workstation(COW) successfully. Compared with serial program，the parallel FEM can save computing time and improve computing efficiency.

Key words rock mechanics；parallel finite element method；bolted rock mass；elasto-plastic analysis

DOI:

通讯作者