

引用本文(Citation):

贾艳艳, 邢学军, 史基安, 等. 2014. 最大准则优化技术在贴体网格中的应用. 地球物理学报, 57(4): 1275-1283, doi: 10.6038/cjg20140424

JIA Yan-Yan, XING Xue-Jun, SHI Ji-An, et al. 2014. The application of the maximum criteria optimizing technique in generation of body-fitted grids. Chinese Journal Geophysics, 57(4): 1275-1283, doi: 10.6038/cjg20140424

最大准则优化技术在贴体网格中的应用

贾艳艳^{1,2,3}, 邢学军³, 史基安¹, 孙国强^{1*}

1. 中国科学院油气资源研究重点实验室, 兰州 730000;
2. 中国科学院大学, 北京 100049;
3. 中国石油冀东油田公司, 唐山 063004

The application of the maximum criteria optimizing technique in generation of body-fitted grids

JIA Yan-Yan^{1,2,3}, XING Xue-Jun³, SHI Ji-An¹, SUN Guo-Qiang^{1*}

1. Key Laboratory of Petroleum Resources Research, Institute of Geology and Geophysics, Chinese Academy of Sciences, Lanzhou 730000, China;
2. University of Chinese Academy of Sciences, Beijing 100049, China;
3. PetroChina Jidong Oilfield Company, Tangshan 063004, China

摘要

参考文献

相关文章

Download: [PDF](#) (3341 KB) [HTML](#) (1 KB) Export: [BibTeX](#) or [EndNote](#) (RIS) [Supporting Info](#)

摘要

贴体网格在地质数值模拟中具有广阔的应用前景,为解决贴体网格生成时边界离散问题,提出了最大长度准则和最大面积准则,把曲线逼近和曲面网格优化问题转化为数学优化问题,为求解该问题,提出了改进的单粒子优化算法.试验表明,最大长度准则和最大面积准则的优化效果好于常规方法;以改进的单粒子优化算法求解该问题时,计算效率是智能单粒子优化算法的30倍左右(节点量为200),从而实现最大长度准则和最大面积准则在贴体网格生成中的应用.针对最大面积准则优化曲面网格不能控制网格步长的情况,提出了限定步长的网格优化算法,使网格步长合理化,并通过实例验证了该算法的有效性.研究成果提供了生成贴体网格时边界优化准则和求解方法,对今后复杂边界的贴体网格生成具有重要意义.

关键词 贴体网格, 最大长度准则, 最大面积准则, 改进的单粒子优化算法, 限定步长

Abstract:

Body-fitted grids have a wide application prospect in numerical simulation of geology. In order to solve the boundary discrete problem in generation of body-fitted grids, we put forward the maximum length criteria and the maximum area criteria which transform the curve approximation and the surface grid optimization problems into a mathematical optimization problem. We further propose a single particle optimization algorithm for solving this problem. Tests show that the maximum length criteria and the maximum area criteria have better optimization effects than the conventional methods. The calculation efficiency of the improved single particle optimizer is thirty times of the intelligent single particle optimizer (200 nodes) when solving this problem, and it achieves the application goal of the maximum length criteria and the maximum area criteria in generating body-fitted grids. Because the maximum area criteria cannot control the grid step length, we propose a limited step length grid optimizer which makes the step length more reasonable. We have tested and verified the effectiveness of this algorithm. The research results provide boundary optimal criteria and the solutions, which have important significance in generating body-fitted grids with complex boundaries in the future.

Keywords [Body-fitted grid](#), [Maximum length criteria](#), [Maximum area criteria](#), [Improved single particle optimizer](#), [Limited step length](#)

Received 2013-08-09;

Fund:

国家重点基础研究发展规划“973”项目“中国西部叠合盆地深部有效碎屑岩储层成因机制与发育模式”(2011CB201104)和国家重大专项“准噶尔盆地深层火山岩储集体形成演化与分布预测”(2011ZX05008-003-40)联合资助.

Corresponding Authors: 史基安, 男, 1958年生, 研究员, 主要从事含油气盆地石油地质和沉积储层方面的研究. E-mail: jashi@lzb.ac.cn Email: jashi@lzb.ac.cn

Service

[把本文推荐给朋友](#)

[加入我的书架](#)

[加入引用管理器](#)

[Email Alert](#)

[RSS](#)

作者相关文章

[贾艳艳](#)

[邢学军](#)

[史基安](#)

[孙国强](#)

About author: 贾艳艳, 女, 1987年生, 山东济宁人, 在读博士, 主要从事含油气盆地石油地质和沉积储层方面的研究.E-mail:
jiayanyandz2@163.com

链接本文:

<http://manu16.magtech.com.cn/geophy/CN/10.6038/cjg20140424> 或 <http://manu16.magtech.com.cn/geophy/CN/Y2014/V57/I4/1275>

[查看全文](#) [下载PDF阅读器](#)

Copyright 2010 by 地球物理学报