



论文摘要

中南大学学报(自然科学版)

ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

Vol.34 No.3 Jun.2003

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文章编号: 1005-9792(2003)03-0315-05

基于格网DEM的自适应等高线内插方法

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摘 要: 利用二元三次样条函数建立了格网数字高程模型的格网内部地形曲面函数,在此基础上,提出了用三次参数曲线求解给定高程的等高线方程及其参数求解条件;为了简化该三次参数曲线的求解,通过实验研究了参数曲线的参数取值范围,运用等值线内插方法时考虑了地形曲面的数学特性;此外,还研究了等值线的存储结构,并与常规存储方法进行对比分析.研究表明:内插结果是具有整体二阶连续的分段三次函数而不是线性函数;该内插方法与常规方法相比,存储结构节省60%-70%的存储空间,并且更适用于基于等高线的各种地学分析.

关键字: 数字地面模型;等高线;自适应算法;内插

An adaptive algorithm of contour interpolation based on grid DEM

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Abstract: Grid based Digital Elevation Model(DEM) surface by bi-cubic spline was created, and an adaptive algorithm for computing contour from DEM was provided. Piecewise parametric cubic curve was used in the adaptive algorithm. In order to solve the contour function simply, the range of parameters by test was studied. The contour is second-order continuous piecewise cubic but not a linear function, and a storage structure of contour information was also studied. The results show that the method can save 60%-70% in storage than that of the tradition method and is particularly appropriate to geosciences application and analysis based on contour map.

Key words: digital elevation model; contour; adaptive algorithm; interpolation

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