

论文

煤田燃烧区地质参数反演原理与应用

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摘要:

根据研究区域物理及几何特性的对称性, 建立了燃烧区二维热传导正分析模型。以地层中上部隔水层厚度与隔水层的热传导系数为未知参数, 建立了未知参数的反分析模型; 以探测井内实测的温度与正分析模型求解的温度数据相比较, 建立误差评价函数, 利用单纯形搜索法对参数不断优化, 使误差评价函数缩小至收敛要求条件, 从而反演得到满足收敛条件的隔水层厚度及热传导系数。根据反分析得到的参数得到研究地层温度场分布, 通过对比发现实测数据与模拟数据基本吻合, 并结合反分析结果与地勘资料的对比, 验证了反分析结果的正确性, 即证明了利用温度场数据反分析得到未知参数的适用性。

关键词: 燃烧区; 热传导; 反分析; 单纯形法

Back analysis of geometry and physics parameters in burning area of coal field

Abstract:

Based on the symmetry characteristic, a 2 D heat conduction model was established, which was calculated with the finite difference method. The impermeable layer thickness and the thermal conductivity of the stratum were unknown parameters in the model. A back analysis model was established to determine the two parameters with the simplex method. It is to suppose a group of parameters firstly, and then put them into the forwards analysis heat exchange model to calculate the temperature data. Then contrast the on the spot survey temperature data and get the relative error. Based on the error, optimize the two parameters with the simplex method until the error reaches to the required value. Then on the spot survey data was closed to the data with the simulated proved by the back analysis method in the paper. The temperature field of the stratum was simulated with back analysis.

Keywords: burning area; heat conduction; back analysis; simplex method

收稿日期 2012-01-04 修回日期 2012-09-17 网络版发布日期 2013-04-24

DOI:

基金项目:

“十二五”国家科技支撑计划资助项目(2012BAB05B04); 重庆市科技计划科技攻关(一般)资助项目(cstc2011ggA30002)

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