

本期目录 | 下期目录 | 过刊浏览 | 高级检索

[打印本

页] [关闭]

论文

对波达波夫和Pride震电波方程组的对比分析

胡恒山

1 哈尔滨工业大学数学系, 哈尔滨 150001。2 大庆石油管理局物探公司, 大庆 163357

摘要: 用Biot介质参数说明了波达波夫震电波方程组中弹性动力学参数的含义, 解释了第一类和第二类震电效应的意义, 在忽略第一类震电效应条件下将该方程组与Pride方程组进行比较, 说明了二者在描述第二类震电效应方面的异同点. 同时指出: 波达波夫方程组忽略了流体与固体的耦合质量; 方程中的黏性耗散项丢掉了—个孔隙度因子, 依据该方程组计算出的弹性波和转换电场的幅度将偏大; 边界条件之一存在错误, 会影响对波在界面上的反射透射规律的描述.

关键词: 震电效应 孔隙介质 弹性波 电磁场 边界条件

A COMPARISON BETWEEN POTAPOF'S AND PRIDE'S EQUATIONS FOR SEISMOELECTRIC WAVES

HU HENGSHAN

1 Department of Mathematics, Harbin Institute of technology, Har bin, 150001, China. 2 Daqing Geophysical Prospecting Company, Daqing, 163357, China

Abstract: Potapof's equations for the first and the second types of seismo electric effects are analyzed. The first type of seismoelectric effect refers to elastic wave induced conductivity change. When no macroscopic static electric field exists, Potapof's equations are reduced

扩展功能

本文信息

- Supporting info
- PDF (192KB)
- [HTML全文]
- 参考文献
- [PDF]
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章

- 震电效应
- 孔隙介质
- 弹性波
- 电磁场
- 边界条件

本文作者相关文章

- 胡恒山

PubMed Article by

to equations for the second type of seismoelectric effect, which is also described by Pride's equations. Comparison is made between these two sets of equations. When ignoring the coupling between elastic and electromagnetic field, both the Pride's and the Potapof's equations reduce to equations for poroelasticity. The elastodynamical parameters in Potapof's equations are explained with well known parameters in Biot's theory for elastic waves. By comparison to Biot theory, it is clear that in Potapof's equations the mass coupling between fluid and solid frame is ignored. The square of porosity is erroneously taken as porosity in the viscous damping term, which may lead to exaggerated amplitudes of the elastic wave and its converted electric wave. And there is an error in the boundary condition about fluid filtration across the interface, which influence the study on the behavior of reflection and refraction of the seismoelectric waves on boundaries.

Keywords: Seismoelectric effect Porous medium Elastic wave Electromagnetic field Boundary conditions.

收稿日期 2001-11-20 修回日期 2002-09-24 网络版发布日期

DOI:

基金项目:

通讯作者:

作者简介:

作者Email: