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论文

时间域全波场各向异性弹性参数反演

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摘要： 从各向异性弹性波的有限元正演方程出发，导出了反问题中 时间域雅可比矩阵求解的计算公式. 它具有与时间域有限元正演方程相同的表达形式，故可 通过有限元正演计算来获得雅可比矩阵. 研究了有限元正演算法的效率和精度、吸收边界条 件等方面的问题，以提高反演系统的效率和精度. 在此基础上，实现了叠前全波场各向异性 弹性参数反演. 计算表明，在初始模型偏离真实模型较大的情况下，层状模型和横向不均 匀模型的反演结果均能准确地收敛到真实模型上.

关键词： 时间域　各向异性弹性波　弹性参数　全波场反演

FULL WAVEFIELD INVERSION OF ANISOTROPIC ELASTIC PARAMETERSIN THE TIME DOMAIN

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Abstract: From the finite element equation of anisotropic elastic waves, a n expr ession is derived for directly calculating the Jocobi matrix. It has the same fo rm as the finite element forward modeling equation. So all the elements of Jocob i matrix can be got through finite element forward modeling. To improve the effi ciency and accuracy of the inversion system, problems such as the efficiency and accuracy of the forward modeling system,

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absorbing boundary conditions and so o n, are also studied. Finally, anisotropic model inversion is carried out with th e finite element inversion system. The inversion results of a stratified model a nd a transversely heterogeneous model accord with real models very well, even th ough the initial modes have great deviations.