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三维倾斜界面PS转换波CMP道集时距及参数估计

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Moveout and parameter estimation of converted waves at CMP gathers from 3D dipping interface

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摘要 在PS转换波资料处理过程中,往往需要联合P波资料提供相应的模型.在实际应用中存在P波和PS转换波层位对比困难.本文仅利用PS转换波数据,通过三维倾斜界面PS转换波CMP道集精确时距关系推导了近似时距解析表达式;分析了PS波的精确与近似时距关系随测线方位、界面倾角与倾向的变化规律及其拟合误差;并讨论了近似时距关系的三个时距参数随方位的变化特征;理论上给出描述时距的三维倾斜界面倾角、倾向、深度、纵波速度和横波速度这5个独立参数的估计方法,并通过理论模拟数据证明了该方法的可行性.

关键词 PS波, 层位对比, 三维倾斜界面, CMP道集, 参数估计

Abstract： In the processing of converted wave data, P-wave data is often needed to be jointed to provide the corresponding model. In the practical application, there is a difficulty in confirming P-wave and PS-wave from the same reflector. In this article PS-wave data is only used and the approximated moveout analytical expressions of PS-waves are derived at the CMP gathers for the three-dimensional dipping interface. The properties and fitness error are discussed about exact and approximate PS moveout which change with survey azimuths,dipping angles and dip orientations. Furthermore, a theoretical parameter estimation method is also given. The five parameters which are dip angle, dip orientation, depth, P-wave velocity and S-wave velocity are used to describe the relation of travel time and distance. An example from a synthetic model is used to show that this parameter estimation method is feasible.

Keywords PS wave, Horizon calibration, 3D dipping interface, Common Middle Point (CMP) gather, Parameter estimation

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