地震学★地球动力学

任意空间取向TI弹性张量解析表述

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摘要　　本文理论给出任意空间取向TI(ATI)四阶弹性张量的解析表述,其以VTI弹性常数及其简单组合为系数,包括各向同性项、TI对称轴方向矢量分量的二次项和四次项,其中TI对称轴方向矢量可以在固定坐标系定义, 也可以相对三维倾斜界面甚至相对波传播方向.相比四阶张量变换法和Bond变换法,ATI弹性张量能简洁而透明地为本构关系和波动方程提供四阶张量的所有元素. ATI弹性张量能为诸多方面的理论研究提供支撑.

## Analytical expression of TI elastic tensor with arbitrary orientation

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**Abstract** In this paper the analytical expression for elastic tensor of TI with arbitrary orientation (ATI) is given that has coefficients as combination of elastic constants of VTI and includes isotropic term, quadratic and fourth-order terms of the direction vector components of TI symmetry axis. Such direction vector of TI symmetry axis could be defined in the fixed coordinates, can also be relative to three dimensional boundaries of the media and even to wave propagation direction. In comparison with fourth order tensor transformation and Bond transformation, ATI elastic tensor can provide all its components in the constitutive relation and wave motion equation concisely and transparently for theoretical investigation in many aspects.

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