

地震学★地球动力学

青藏高原中部Quasi-Love波的识别及其转换点揭示的东西向方位各向异性变化

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摘要 目前人们利用4种基本的地震波现象研究地震各向异性, 如横波双折射、面波散射、与传播方向有关的走时异常和PS转换波震相.本文利用面波散射产生的Quasi-Love (QL)波研究青藏高原上地幔顶部的各向异性结构特征.首先利用中国地震台网昌都(CAD)台记录的地震波形资料识别出产生QL波的路径, 并利用合成地震记录 and 垂直偏振极性分析证实所观测到的为QL波, 而不是高阶振型的Rayleigh波或其他体波震相; 然后由Rayleigh波、Love波和QL波的群速度估算了各向异性结构横向变化的转换点; 不同周期时, 转换点的位置不同, 这种频率依赖性还需要进一步的模拟研究.Love波向Rayleigh波耦合(产生QL波)的转换点位置揭示了青藏高原面波方位各向异性变化特征, 并以南北向构造带的东西分段性、上地幔流引起的地球内力诱导岩石形变解释了青藏高原各向异性的东西向差异性.

关键词 [Quasi-Love波](#) [青藏高原中部](#) [各向异性](#)

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Identification of Quasi-Love waves and its implication of east-westward azimuthal anisotropy gradient in the upper mantle of the central Tibet

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**Abstract** Seismic anisotropy can be studied by four basic seismic wave behaviors, e.g, direction-dependent travel time anomalies, shear-wave birefringence, surface-wave scattering, and direction-dependent conversion of compressional waves to shear waves. In this paper, Quasi-Love (QL) waves, generated by surface wave scattering, are utilized to determine the variation of uppermost mantle anisotropy of Tibet plateau. Firstly, QL waves are identified from the seismograms of the selected paths recorded by the CAD station. The observed QL waves are confirmed by distinguishing QL waves from higher mode Rayleigh waves or other body waves, which are absent in synthetic seismograms. Furthermore, the location of azimuthal anisotropy gradient is estimated from the group velocities of Rayleigh wave, Love wave and QL wave. Finally, the characteristic of azimuthal anisotropy of upper mantle in Tibet plateau is summarized. The reason of the existence of azimuthal anisotropy gradient can be explained by east-west variation of tectonics. Also the other reason is the force from the upper mantle flow which has led to voluminous rock deformation.

**Key words** [Quasi-Love wave](#); [Central Tibet Plateau](#); [Anisotropy](#)

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