

Radial anisotropy as "bodywave-surface wave discrepancy"

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The lithosphere-asthenosphere system (LAS), especially beneath the ocean, is known to have pronounced radial anisotropy (transverse isotropy with vertical symmetry axis, VTI), but its physical origin is not well understood. Radial anisotropy in the mantle has been often associated with "Rayleigh/Love wave discrepancy", but it could be also due to other factors. Recently, Kawakatsu et al. (2015) and Kawakatsu (2016a,b) have introduced a new fifth parameter in VTI system that describes the incidence angle dependence of bodywaves. Rayleigh wave dispersion has a strong sensitivity to this parameter (Kawakatsu, 2016b), and thus it can also affect the strength of radial anisotropy.

Song and Kawakatsu (2012) has demonstrated how bodywaves that enter the LAS with different incident angles can be used to constrain asthenospheric anisotropy. Also the reflection/conversion efficiency at the G-discontinuity depends on the fifth parameter in a peculiar way. Thus bodywaves can provide additional information about radial anisotropy of the LAS, and it is possible to view radial anisotropy as "bodywave-surface wave discrepancy" through the new parameter, η_k . Lateral change of the strong asthenospheric anisotropy may be due to this effect.