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Crustal structure beneath the volcanic region of Tengchong (China) from shear-wave splitting

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Correlation and spectral ratio methods have been used to obtain shear-wave splitting parameters, time delay and fast wave polarization, for different seismic phases which were recorded by deep seismic profiling conducted in 1999 in the volcanic region of Tengchong. Based on a common reflection cell stack method the acquired parameters were back-projected on the crustal structure beneath the study region. The fast wave polarization azimuth is predominantly north-south, except for a few local anomalies in the upper-to-middle crust. This result not only agrees with the contemporary observation of crustal movements measured by GPS in the Tibetan Plateau around the Eastern Himalayan Syntax, but also implies that the attributes of rigid upper-to-middle crust differ from those of “soft” lower crust. The images of time delay and fast wave polarization show that the crack density is generally high, and there are two remarkable positive time-delay anomalies on both sides of Tengchong. A few cracks related to the magma activity may exist in the upper-to-middle crust, being the origin of volcanic magma chambers formed by the accumulation of materials coming from the upper mantle.