

Shear-wave splitting beneath the Taiwan

Presenter: JEN-CHI CHUNG Advisor: Hao Kuo-Chen

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Abstract

Shear wave splitting in regional and teleseismic shear waves has been analyzed for fast polarization directions and delay times at permanent and temporary seismic station in the Taiwan region. We applied particle motion and cross correlation methods to estimate its polarization directions and delay times.

Earlier results show an island-wide pattern of fast polarization directions alignment with N-NE structural trends in southern and central Taiwan and then turn smoothly to EW following the structural bight in northern Taiwan. In active collisional orogeny large δt are often observed. Because δt for crustal events are usually less than a few tenths of a second, and because the lower mantle is not likely to be the source of splitting, the observed δt of one to two seconds must be produced in the upper mantle.

The observed splitting parameters are consistent with upper mantle anisotropy resulting from the collisional tectonics that built the Taiwan orogeny and that this tectonic compression involved the lithosphere and is characterized by a strong coherent deformation of the upper mantle and the crust.

Reference

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