

**The signature of lithospheric anisotropy at post-subduction continental margins:
New insight from XKS splitting analysis in Northern Borneo**

ABSTRACT

The relative paucity of recent post-subduction environments globally has meant that, so far, little is known about tectonic processes that occur during and after subduction termination, as previously convergent tectonic plates adjust to the new stress regime. The region of Southeast Asia that now encompasses northern Borneo has been host to two sequential episodes of subduction—both now terminated—since the mid-Paleogene. It is expected that these processes will have left signatures in the fabric of the upper mantle, which are manifest in the form of seismic anisotropy. We investigate the evidence for, and alignment of, anisotropic fabrics by measuring the splitting of a family of teleseismic shear phases. These observations provide a measure of the orientation of the effective anisotropic elastic tensor, in the form of the orientation of the fast shear-wave polarization, ϕ , and add constraints on the strength of the anisotropic fabric, in the form of the delay time, δt . We observe two principal trends across northern Borneo that appear to be confined to the lithosphere. These patterns are likely related to tectonic processes associated with subduction, continental collision, and oceanic basin formation, events that can exert primary influence on the formation of post-subduction settings.