3D seismic velocity structures beneath high-strain-rate zones in Japan: Implications for a cause of stain concentration

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There are several high-strain-rate zones in the Japanese Islands where contraction rate is a few times larger than the surroundings. Tomographic studies have revealed the existence of low-velocity anomalies in the mantle and lower crust beneath high-strain-rate zones such as the Niigata-Kobe Tectonic Zone or the Ou Backbone range in Tohoku. It is considered that anelastic deformation could take place in such low-velocity anomalies and consequently strain concentration would occur at the surface.

This study presents detailed seismic velocity structures beneath high-strain-rate zones in the Japanese Islands inferred from recent travel-time tomography, and discusses the origin of high-strain-rate zones in terms of low-velocity zones in the uppermost mantle and lower crust.