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## **A methodology for inversion of broadband seismic waveforms for elastic and anelastic structure and its applications**

### **Abstract**

We develop a quantitative and objective methodology for inversion of body-wave waveform data for elastic and anelastic structure. We obtain an average positive SH velocity anomaly beneath the Philippine Sea Plate for all depths. We also find a negative SH velocity anomaly in the region of 300-400km beneath subduction zone to the east of Japan and its southern extension beneath the Marianas ("Pacific East" region). Our inversion for anelastic structure finds a lower Q, as compared to PREM, for all of the subregions and finds some regional variations of the Qs structure. The low Q may affect the partial derivatives of the seismic velocity with respect to temperature by a factor of two. Especially beneath the Philippines Sea, we find low Qs values down to 700 km. This might be explained by rich water content beneath the mantle wedge.