波形インバージョン法による D" 層内部の３次元 S 波地震波速度構造推定

＃河合 研志 [1]

[1] 東大・総文

Full waveform inversion for 3D S-velocity structure in the D" region

Kenji Kawai[1]

[1] Tokyo Univ.

http://kenjikawai.jimdo.com/

We formulate the inverse problem of waveform inversion for localized 3-D seismic structure, computing partial derivatives of waveforms with respect to the elastic moduli at arbitrary points in space for anisotropic and anelastic media. In this study we minimize computational requirements by using the Born approximation with respect to a laterally homogeneous model, but this is not an inherent limitation of our approach. We solve the inverse problem using the conjugate gradient (CG) method, using Akaike's Information Criterion (AIC) to truncate the CG expansion. We apply our method to invert for 3-D shear wave structure in the lowermost mantle beneath Central America using a total of 2154 waveforms at periods from 12.5 to 200 s recorded at stations near the Pacific coast of North America for 29 deep and intermediate-depth events beneath South America. The resulting model shows lateral heterogeneity in the E-W direction, which may be associated with a subducted cold slab surrounded by hotter materials with slower velocities. Various tests show that our model is robust.