

A probabilistic approach to surface waves tomography of the upper mantle and lithosphere/asthenosphere boundary characterization

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We have developped a non-linear, stochastic inversion procedure to generate 3-D upper mantle models from surface waves dispersion data.

This probabilistic approach is based on the parametrization of models using a (regional or global) optimized basis of smooth functions constructed by principal component analysis of a homogenized reference model.

It provides a reduced and optimized parameter space for the Bayesian inversion of an ensemble of seismic models.

The appraisal of the output ensemble of models allows for lateral regularization and probabilistic characterization of geological features within the model.

We have applied this inversion procedure using CUB (Shapiro & Ritzwoller 2002) as a starting model with an emphasis on the lithosphere/asthenosphere boundary properties.

Keywords: Seismology, Tomography, Surface waves, Probabilistic inversion, Lithosphere/asthenosphere boundary