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# Proxies of oceanic Lithosphere/Asthenosphere Boundary from Global Seismic Anisotropy Tomography

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Surface waves provide essential information on the knowledge of the upper mantle global structure despite their low lateral resolution. This study, based on surface waves data, presents the development of a new anisotropic tomographic model of the upper mantle, a simplified isotropic model and the consequences of these results for the Lithosphere/Asthenosphere Boundary (LAB).

As a first step, a large number of data is collected, these data are merged and regionalized in order to derive maps of phase and group velocity for the fundamental mode of Rayleigh and Love waves and their azimuthal dependence (maps of phase velocity are also obtained for the first six overtones). As a second step, a crustal a posteriori model is developped from the Monte-Carlo inversion of the shorter periods of the dataset, in order to take into account the effect of the shallow layers on the upper mantle. With the crustal model, a first Monte-Carlo inversion for the upper mantle structure is realized in a simplified isotropic parameterization to highlight the influence of the LAB properties on the surface waves data. Still using the crustal model, a first order perturbation theory inversion is performed in a fully
anisotropic parameterization to build a 3-D tomographic model of the upper mantle (an extended model until the transition zone is also obtained by using the overtone data). Estimates of the LAB depth are derived from the upper mantle models and compared with the predictions of oceanic lithosphere cooling models. Seismic events are simulated using the Spectral Element Method in order to validate the ability of the anisotropic tomographic model of the upper mantle to re- produce observed seismograms.