



Regional body waves: a multifrequency measurement approach

Eoghan Joseph Totten, Kasra Hosseini-Zad, Tarje Nissen-Meyer, and Karin Sigloch

University of Oxford, Earth Sciences, Oxford, United Kingdom (eoghan.totten@env-res.ox.ac.uk)

Regional body waves, observed between 14-29 degrees epicentral distance, exhibit strong sampling of mantle transition zone depths (~410-690km) and can be used for tomography of the upper mantle. Finite frequency and full waveform inversion renders it possible to harness the triplicated codas. We improve on prior work that modelled triplicated body waves using ray-based synthetics and instead use full waveform forward modelling based on the spectral element code, AxiSEM. We present a revised data processing workflow that performs well on regional body wave codas. We deliver multifrequency travel time measurements <0.5Hz beneath Japan, by cross-correlation with synthetic waveforms from AxiSEM. Time windows are informed by earthquake source time function, event depth and source-receiver azimuth, in order to omit overlapping phases from the cross-correlation window.