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Full waveform tomography of the South Atlantic upper mantle

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We present a full waveform tomography of the upper mantle beneath the South Atlantic. Full waveform tomography allows us to exploit the maximum amount of information from each seismogram in a very efficient way. Our approach is thus well suited for regions with comparatively low data coverage such as the South Atlantic. We employed the adjoint method to correct our model Earth, quantifying differences between the observed and the synthetic waveforms using time-frequency misfits. We have used about 3400 vertical-component and about 700 horizontal-component seismograms, comprising fundamental- and higher-mode surface and long period P and S body waves in the period range form 120 to 250 s. After three iterations we fit Rayleigh and body waves acceptably well: the total time-window length of the fitted portions has increased by a factor of 2, with a 50% misfit reduction over the original time-windows.