

Synthetic test 1: Spherical void in half-space

TODO: Invert a model with an embedded spherical low-velocity zone from a homogeneous initial model. The inversion is performed through a number of iterations in different frequency bands.

Abstract: Before applying to field data sets, the 3-D full waveform tomography method was tested on synthetic data sets to investigate the method capabilities. Synthetic studies allow data from specific scenarios to be generated for inversion. Synthetic model refers to an crustal model whose velocity profile (i.e. S-wave and P-wave velocities of cells) is assumed or known a priori. Using a known velocity structure, seismogram data is calculated for an assumed test configuration (i.e. locations of a set of sources and receivers). This waveform data is then input to the inversion program as if the seismograms were acquired from field stations, and velocity structure is extracted (i.e. inversion) from the waveform data. Theoretically, the interpreted velocity profile should be the same as the model assumed at the start.