

Estimating seismic attenuation in the earth: an example from the LA RISTRA teleseismic array, southwestern United States

Jonathan MacCarthy

The energy spectrum released during a seismic event is an important function to seismologists and to policy-makers. It can be used to estimate material properties of the earth and to describe the source of the event. However, earth materials are not perfectly elastic, and seismic energy is lost over time due to intrinsic attenuation. I will describe attenuation, how it is measured using the method of spectral slopes, and discuss how to estimate a spatial model of the attenuation parameter, Q^{-1} , in the earth. To do so, I will present an example case using teleseismic data from the LA RISTRA experiment, a dense linear array of broadband seismometers obliquely traversing the 4-corners region. Nearly 7000 synthetic attenuation measurements from 200 distant earthquakes are used to invert for a 2D model of Q^{-1} beneath the 4-corners region.