

Local and Regional Wave Propagation

Seismograms reflect the combined effects of the source, recording instrument, ambient noise, and the propagation path. Especially for recording at distances smaller than 10° the signal is affected mainly by the crustal structure, as waves propagate in the crust and/or along Moho. Therefore appearance of regional seismograms varies strongly, which complicates record interpretation and phase identification severely. However, for earthquakes with small magnitudes, close distance records are the only ones available with a sufficient signal at all. Due to sparse seismic station coverage and the use of only the most distinct phases, typically Pg and Sg, localization can not always be ensured. Yet, retrieving accurate earthquake location, including depth information and the relation with faults is important for understanding tectonic processes and for estimating seismic hazard. Prior works by e.g. Ma (2010) show the benefit of using additional regional phases for localization, in particular depth. At local and regional distances the challenge lies in robustly detecting and identifying these phases correctly, which are usually superimposed by the coda of the P- and S-phase and sometimes even arrive simultaneously. In this work we want to shed light on the different influences on seismograms at local distances < 300 km.

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