Geophysical Research Abstracts
Vol. 20, EGU2018-629-2, 2018
EGU General Assembly 2018

Frequency-Dependent Shear Wave Attenuation Along the Western Part of the North Anatolian Fault Zone

Gizem Izgi (1), Tuna Eken (1), Peter Gaebler (2), and Tuncay Taymaz (1)

(1) Department of Geophysical Engineering, The Faculty of Mines, Istanbul Technical University, Maslak 34469, Istanbul, Turkey (izgi@itu.edu.tr, eken@itu.edu.tr, taymaz@itu.edu.tr), (2) BGR Federal Institute for Geosciences and Natural Resources, Hannover, Germany (peter.gaebler@bgr.de)

A proper knowledge of the crustal structure along the North Anatolian Fault Zone (NAFZ), about 1600 km long transform boundary between the Eurasian and Anatolian plate, plays a key role in understanding the past/present tectonic processes in relation to the deformation history. At present, the western part of the NAFZ is the seismically most active. That is the main motivation for us to investigate crustal heterogeneities particularly in this region. Intrinsic and scattering attenuation properties of the heterogeneous medium cause a decrease in seismic wave amplitude during propagation between source and receiver. Present work aims at revealing frequency-dependent crustal attenuation parameters beneath the western part of the NAFZ. To achieve this, we apply the acoustic radiative transfer theory (RTT) under the assumption of multiple isotropic scattering to generate synthetic seismogram envelopes. Our inversion procedure depends on finding an optimal fit between observed and synthetically computed coda wave envelopes in four different frequency bands (1.5 to 12 Hz). Our preliminary models of the 2D lateral distribution of intrinsic and scattering attenuation tend to mark the presence of different crustal blocks (i.e. Armutlu-Almacık, Istanbul-Zonguldak and Sakarya Zones) separated by the southern and northern branch of the western part of the NAFZ. In general, scattering attenuation appears to be dominant over intrinsic attenuation in the study area.