



Coda-attenuation imaging of the North Anatolian Fault Zone, northern Turkey

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The North Anatolian Fault (NAF), a right-lateral strike-slip fault spanning 1500 km in length, stretches across northern Turkey and it marks the boundary between the Eurasian and Anatolian plates. Nucleating in the east, at the Karliova triple junction and reaching the Aegean Sea at the west, it is a particularly active fault zone with a series of migrating high-magnitude earthquakes. Using 6445 Z-component waveforms from a temporary seismic network in the area (Dense Array for North Anatolia – DANA), this study aims to investigate the western part of the NAF, which splays into a northern and southern branch. Coda attenuation imaging is utilised for imaging the absorption characteristics of the area, as it can be used as a marker for source and dynamic Earth processes due to its higher sensitivity to small variations of lithospheric properties compared to seismic velocity. The absorption structure is recovered by inverting for the coda attenuation quality factor, Q_c , at frequencies between 3-18 Hz, using sensitivity kernels. The extensive seismicity in the area, as well as the density of the seismic stations, provide high-resolution models of 0.04-0.05 degrees in spacing. The scattering structure of the region is imaged using peak-delay time, which is used as a direct measure for multiple forward scattering. Preliminary results show a clear change in scattering between the Istanbul and Sakarya zones, north and south of the fault respectively, with the scattering increasing from north to south at lower frequencies and decreasing at higher frequencies. At a smaller scale, absorption and scattering anomalies appear to outline contrasting geological units beneath the DANA network.