



## Seismic attenuation in the Tyrrhenian Sea: estimation of coda quality factor $Q_c$

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The present study aims to characterize the Tyrrhenian Sea by focusing on its lateral variations of seismic attenuation. We measure seismic attenuation using the coda quality factor  $Q_c$  in the assumption that  $Q_c^{-1}$  is a measurement of seismic absorption at long lapse time from the origin of the earthquakes. We use seismic data of the major events occurred in central Italy and recorded by the INGV and LISARD seismic networks. We analysed the main coherent phases recorded in the frequency range from 0.4 Hz to 2 Hz. In the selected coda window,  $Q_c^{-1}$  values are calculated through a linear regression using the energy exponential decay law obtained by Aki and Chouet (1975) in the multiple scattering model. We finally set up an inversion using coda-wave sensitivity kernels, obtaining the results and testing them with standard tomographic techniques. The  $Q_c^{-1}$  maps are consistent with volcanic and geological structures at surface and allow to speculate on the possible upwelling of fluids. A major anomaly is located in the southern Tyrrhenian Sea and physically represents a low-attenuation region. High-attenuation anomalies in central Italy, in proximity of the recent seismic swarm of 2017, may indicate the possible break-off of the subducting slab (already suggested by seismicity and seismic tomography) which causes upwelling of fluids and modifies the attenuation and rheology of the crust.

Aki, Keiiti and Bernard Chouet (1975). "Origin of coda waves: source, attenuation, and scattering effects". In: *Journal of geophysical research* 80.23, pp. 3322-3342.