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P-wave scattering attenuation images of Tenerife island using Autocorrelation Functions from velocity seismic tomography fluctuations

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We use the new quantitative approach developed by De Siena et al., 2011, to calculate the scattering attenuation coefficient at Tenerife (Canary Island, Spain) from the space distribution of the P-wave seismic velocity. We calculate the space autocorrelation function (ACF) of the vertical velocity fluctuations, as a function of depth and for any couple of surface coordinates from the velocity tomography obtained by Garcia-Yeguas et al. (2012). We then fit the measured velocity random fluctuations with the theoretical exponential ACF, and estimate from the fit both spatially averaged the mean square (MS) fractional fluctuations and correlation distance, in turn associated with the inverse scattering quality factor, assuming a Born scattering fluctuations. In this way for any couple of space surface coordinates we associate an average (over depth) inverse quality factor, Q-1PSc. The Q-1PSc map shows that the largest scattering attenuation is located in the middle of the island, in a zone almost coincident with the caldera structure. The S-wave scattering attenuation shows an opposite pattern (Prudencio et al., 2013) with the minimum scattering attenuation coinciding with the caldera structure. This (preliminary) result may appear as contradictory, but in reality shows that most the of scattering phenomena at high frequency are associated with the shear waves.