



Scattering and intrinsic attenuation of seismic energy in eastern Sicily (Italy)

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We performed a comparative analysis on attenuation of seismic waves in two tectonically active areas located in Eastern Sicily (the Straits of Messina and the Hyblean Foreland). In particular, we compared the estimates of scattering (inverse- Q_s) and intrinsic absorption (inverse- Q_i) obtained by applying the Multiple Lapse Time Window Analysis (MLTWA; Hoshiya et al., 1991), under the assumption of multiple and isotropic scattering and uniform distribution of scatterers. This method gives information about the temporal change of seismic energy during wave's propagation by considering energy in multiple consecutive time windows as a function of hypocentral distance. Local earthquakes were selected and analysed in the frequency range 1.5-15 Hz. The integrated observed energies were calculated in three consecutive windows 12 s long, starting from the S-wave onset. Results show for both areas a dominant scattering attenuation mechanism at frequencies less than 3 Hz. Conversely, above 3 Hz intrinsic attenuation is dominant in the Hyblean foreland whereas in the Straits of Messina the Q_i and Q_s are approximately equal, inside the experimental errors. Moreover, for both areas Q_s values show a strong frequency dependence which is related to the size of heterogeneities. This indicates that the heterogeneities, responsible for the scattering are, at least, comparable with the wavelength for the lowest frequencies analysed (few kilometres).