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Anelastic structure of the Mediterranean basin: inverse shear Q models for the lithosphere-asthenosphere system based on the stochastic inversion of local anelastic attenuation coefficients from Rayleigh wavetrains

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An approach to the anelastic structure of the Mediterranean basin is achieved by the analysis of more than 3000 Rayleigh wavetrains recorded in 24 VBB stations belonging to different networks and located in Mediterranean countries. 124 path-averaged anelastic attenuation coefficients of the Rayleigh wave fundamental mode are determined (15-120 s period range) by means of the well-known two-station method, which implies the selection of appropriate wavetrains and the application of spectral filtering techniques to separate the fundamental mode from higher modes. Local attenuation coefficients are then deduced from the path-averaged values by adapting the Ditmar-Yanovskaya formulation. Besides the local values and their uncertainties, this formulation permits to quantify several patterns of their resolution degree: the mean averaging radii and the semi-axis of the ellipses of resolution and the azimuth of the poorest resolution. The spatial distribution of the local attenuation coefficients for the different analysed periods provides a first qualitative description of the anelastic structure under the Mediterranean basin. The spatial patterns agree quite well with the main seismotectonic characteristics of the region. Additionally, the stochastic inversion of the local attenuation coefficients leads to derive 3-D models of inverse shear Q for the lithosphere-asthenosphere system.