Objective regionalization of the Mediterranean basin from Rayleigh wave anelastic attenuation coefficients

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An objective regionalization of the Mediterranean basin has been achieved by means of the average linkage (AL) clustering algorithm applied to local anelastic attenuation coefficients of Rayleigh waves fundamental mode (15-120 s period range). The elements to be classified are the cells into which the Mediterranean basin has been divided. The cell size is chosen according to the resolution of the local anelastic attenuation coefficients derived by means of the Yanovskaya-Ditmar formulation. Each cell is characterized by a local anelastic attenuation curve. Prior to the classification itself, a principal component analysis (PCA) is applied to the set of local attenuation coefficients describing each cell. In this way, the AL process is considerably improved and the Mediterranean Basin is finally divided into a set of rather homogeneous domains. After that, the Herrmann's stochastic inversion software has been used to invert the anelastic averaged attenuation coefficients curves for each one of the mentioned domains. Thus, a representative average anelastic model is derived for each region. In this way, the detailed knowledge of the lithosphere-asthenosphere elastic structure of the Mediterranean basin, achieved some years ago by means of the study of Rayleigh wave group velocities, is complemented here with the anelastic structure.