3-D SHEAR VELOCITY MODEL OF THE UPPER MANTLE BENEATH THE AEGEAN SEA (GREECE)
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The purpose of this work is to obtain a 3-D shear velocity model of the upper mantle beneath the Aegean. In this work, averaged phase velocities of fundamental mode Rayleigh wave were determined along 36 interstation profiles across the Aegean in the period range 10-100 s. Phase velocities were further inverted to produce 1-D path average velocity models. The interpolation of these models yielded a 3-D image of wavespeed lateral variations through the Aegean area. However, due to the irregular distribution of ray paths in the region and the limited data set, interpolation could not provide stable results for the large-scale lateral velocity variations, or constraints on the model.

This dataset is combined in a continuous regionalization tomographic scheme, to derive a smooth model of lateral velocity variations and a qualitative estimation of the model constraint as a function of geographical possibilities. Observations reveal significant velocity variation between continental Greece (low velocities) and the Aegean (high velocities). A low velocity zone is observed beneath the North Aegean Trough. In South Aegean, high velocities are observed in the subducted African lithosphere beneath the Aegean. Low velocity zones are associated with regions of high strain rates, recent volcanism and high heat flow. These observations suggest a hot or perhaps partially molten mantle and/or distributed deformation of the upper mantle beneath this region, probably related with the slab role.

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