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# T1.2-P12. ONLI: a code for optimized non-linear inversion of surface-wave dispersion data

A code for Optimized Non-Linear Inversion (ONLI) of surface-wave dispersion data is developed. It is based on Monte-Carlo numerical search method. The structure is modeled as a stack of horizontal homogeneous layers and S-wave velocity and thickens for some of the layers are parameterized. Velocity of P-wave and density of relevant layers are calculated by empirical or theoretical relationships or fixed by published structural information. ONLI is programmed to explores parameters' space in two modes: full and selective search. Full search explores each parameter range, changing the value of relevant parameter by a step. Selective search tests only extreme values of each parameter range in several iterations, decreasing the range by a step in following iteration. Earth's upper velocity structure is retrieved, with relevant errors, for specific depth range, depending of the available dispersion data. The main innovation of the software is the examination of assembled models by number of criteria, including Moho boundary depth range and rules for S- and P-wave velocities and density. Only the models satisfying these conditions are processed furtherly, reducing considerably the computation time. Number of tests explored the impact of parameterization and proved ability of ONLI approachs to deal with non-uniqueness of inversion problem.

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