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**Inversion of velocity parameters in multilayered elliptic anisotropy
medium – synthetic
data example**

Abstract

In the medium composed of parallel sedimentary layers, model of elliptic anisotropy is often better approximation of real conditions than simple layers with constant velocity. In such model a velocity is described with 3 parameters: a , b (responsible for vertical velocity and its gradient) and χ – elliptic anisotropy coefficient, describing changes of velocity with direction of wave propagation. In this case, seismic rays are no longer straight lines but elliptic-shaped curves. In this contribution we present a tool for inversion of velocity parameters in multilayered medium considering model of elliptic anisotropy. Input data contains measured traveltimes of direct wave between all sources and receivers. The depth of boundaries and existence of elliptic anisotropy in specific layers are not subject of inversion. In order to obtain each synthetic traveltime, necessary for the target function, ray tracing must be carried out using Fermat's principle directly. The optimization in both parameters inversion and ray tracing is local and performed with Simplex algorithm from GSL library. The tests of the tool was conducted on the synthetic data with various types of start model containing one or more layers with or without elliptic anisotropy.