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THE STUDY OF THE INFLUENCE OF PERIODIC LATERAL VELOCITY VARIATIONS ON THE TIME-DISTANCE GRAPH IN THE REFLECTION METHOD

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Purpose. To study the effect of insufficient consideration of lateral and sinusoidal velocity variations on the obtained features of the reflecting boundary behaviour under the standard interpretation scheme in the CMP method.

Methodology. To assess the main features of the effect of underestimation of lateral velocity variations, the simplest model of the geological medium with one reflecting boundary is considered. For a given model, a direct seismic task has been solved with the help of the Tesseral program, and seismograms for two variants have been obtained.

Findings. As a result of modeling the reflection time-distance graphs for a horizontal structure with a linear velocity change along the lateral show a high degree of coincidence both for the exact formula and for numerical modeling. It is shown that a horizontal layer with variable velocity (with a linear lateral nomenclature) and a variable layer with constant velocity are equivalent in the reflection time-distance graphs. The case of a medium with sinusoidal velocity variations in a layer in the common depth point method is considered. The parametric equations of sinusoidal velocity variations in a layer are found. The formula for the hodograph of the reflected wave for a medium with sinusoidal velocity variations in a layer is found. The travel time curves of the reflected wave for a horizontal medium with an average horizontal velocity and for a medium with a sinusoidal velocity variation are simulated.

Key words: the CMP method, modeling, lateral velocity variations, time-distance graph

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