

# CONVERSION AND TRANSMISSION OF ELECTRICAL ENERGY IN A COMBINED ELECTROMECHANICAL CONVERTER FOR HYBRID AND ELECTRIC VEHICLES.

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**Purpose.** Creation and effective control of a combined converter for electromechanical systems with alternating and direct current sources, as well as, in reducing capital costs in the scheme for constructing the electric drive of vehicles.

**Methods.** To control the operating modes of AC and several DC components using a single converter, a special circuit must be arranged. For this purpose, one of the DC sources on one side must be connected to a common (zero) point of the AC electric motor, and the second side of the converter output to another DC power source. Using a special control law of the keys of the converter, separate control can be achieved. Thus, one converter performs the function of controlling two power supplies.

**Finding.** This scheme is a prerequisite for solving the problem of combining several sources of electrical energy using one converter that simplify the drive system of hybrid and electrical vehicles. This article shows the principles of constructing and controlling such a scheme, and describes its physical processes.

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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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