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# THERMAL ANALYSIS OF AUTONOMOUS VOLTAGE INVERTER FOR CONTACTLESS CHARGE BATTERY OF THE UNDERWATER ROBOT

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## ABSTRACT

Operating conditions of autonomous inverter for contactless charging system requires its placement in secure container of limited capacity. It determines the relevance of the problem of heat removal from the power components. Investigation of heat transfer processes for two variants of inverter allowed defining permissible current loads and relate time of underwater vehicle batteries charging with temperature and type of environment. The problem is solved with the help of mathematical modeling software package SolidWorks FlowSimulation as well as a full-scale experiment, which provided for clarification of tuning coefficients of the model and confirmed the accuracy of the simulation results. The study was carried out for various operating conditions of the inverter in the air and in the water.

**Keywords:** unmanned underwater vehicle, contactless power transmission, voltage inverter, power modules, linkage, heat transfer, mathematical simulation, load limits, charge time, full-scale experiment

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