Fig. 3

Solar panels for a house in the village

The climatic conditions in the village make the use of solar batteries advantageous: on its territory, annual solar radiation per square meter exceeds 5000 MJ.

Such indicators allow to receive up to 120 W of power from one square meter of battery, so for a family consuming an average of 250 kW of energy per month, there will be enough battery with a total area of 7-10 sq.m.

Before buying solar panels for the house will need to perform a preliminary calculation taking into account the climatic features of the territory. However, the supplier company will do it.

Insolation rate (kWh / m2 / day) for cities by months, which helps to calculate the real efficiency of solar panels for the house.

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MODELING OF SELF-ADAPTIVE MEASURING SYSTEM
BASED ON EDDY CURRENT SENSORS

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Eddy current method finds a wide application in automation systems and control, in particular for the constructing sensors being designed for contactless measurement of the position of conductive objects, their electrical parameters and temperature, thickness of sheets and foils, etc. An important advantage of eddy current sensors is insensitivity to the influence of environmental parameters such as humidity, pollution, temperature, electromagnetic radiation, etc [1].

Many questions of practical constructing of measuring systems require the development of mathematical models those allow to carry out a direct transition from the physical quantities of the inspected environment to the required parameters of measurement and control. In general, the methods currently known are used for interpolation or/and approximation of the radiator electromagnetic field in the conditions of close proximity of an electrically conductive inspected object.

A model based on an exponential approximation of the input impedance of the radiator of electromagnetic field is considered in the report and allows obtaining sufficiently accurate analytical relations linking the above parameters [2]. This makes it possible to study mutual influence of the measured parameters, the influence of external factors (e.g. temperature), to estimate measurement errors.

Actual researches in the field of practical use of the eddy current method are related with the subject of compensation of interfering factors, influence of geometry of the radiator of a high-frequency electromagnetic field, material characteristics of the inspected object (electrical conductivity with corresponding target temperature, magnetic permeability and influence of target thickness), mutual arrangement of the radiator and the object.

The approach developed by the authors of the report leads to analytical relationships that can be used for the implementation of two - and three-parameter measurements by means of eddy current sensor systems. At the same time, there are possibilities to largely bypass difficulties caused with the need to take into account the nonlinear relations between quantities included in the mathematical expressions used in modeling [3].

Methods from different areas of digital signal processing (digital demodulation, special analysis, signal reconstruction, linearization with polynomial approximation, calibration, etc.) are used in the processing of measurement results.

The stages of practical measurements and calibrations are performed using a modular software framework called ICONNECT that also allows to implement a nonlinear optimization of the model parameters and to test the behavior of the desired system [4].

The software operates in real time on a standard PC or an embedded system and is equipped with a wide range of different functional blocks, so that it is possible to obtain graphs of current data at cycles of one millisecond or less. The resulting values are then used to clarify the coefficients included in the calculated ratio, and thus minimize modeling errors.

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INTELLECTUAL INFORMATION SYSTEMS

(Karshi branch of the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi)

Abstract: In modern science, under research related to the modeling of human intellectual capabilities, one understands the scientific direction occupied by problems of the synthesis of automatic structures capable of solving complex problems of information support of various types of human activity. Usually these are tasks for which, for one reason or another, there are no ready-made rules or examples of solutions. Develop a rule for solving such a problem can a person with the necessary knowledge, experience and intelligence. Among these tasks, the most difficult and urgent task is to develop the means of human communication with a computer system that simulates the human intellect in natural language and the task of automatic machine translation from one language to another, provided that the semantic and emotional aspects are accurately conveyed. Only with the help of absolutely natural means of communication between a person and an automaton executing a computer program will it be possible to create systems adequately modeling human intelligence and such properties as thinking, intuition, consciousness and subconsciousness. Such systems in modern computer science are called intellectual information systems.

Key words: *intellectual systems, intellectual task, automated information systems, intellectuality of information systems.*

The current state of fundamental and applied research in the field of intelligent information systems allows us to consider that their results have become quite definite. This means that a relatively stable system of concepts has developed, a methodology for designing, constructing and implementing has emerged, and the typical structures of such systems and their components have been defined.

It is generally accepted that the intellectual task is to find an unknown algorithm for solving a practical or theoretical problem that is universal on the set of original data inherent in this problem. It is only necessary that the performer solving the problem be able to perform those elementary operations from which the process is composed, and, in addition, that he is pedantic and carefully guided by the proposed algorithm. Such a performer (man or machine), acting purely mechanically, can successfully solve any problem of the type in question. Therefore, it seems quite natural