Interactive Presentations (IP)
Topic 7 - Interactive Presentations (7)

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WIRELESS TRANSMISSION OF ENERGY AND INFORMATION, SHAPE CONTROL OF LARGE STRUCTURES

Abstract

To develop a wireless system for controlling the shape of large-sized transformable structures, it is necessary to highlight the problem to be solved, as well as to clarify its structure and composition of the developed control system. The problem solved with the help of the is reduced to controlling the reflector radiation pattern by adjusting the shape of the frontal antenna network at certain points of actualization by changing the cable length of the actuators, energy and information to which are transmitted wirelessly. The control computer contains information about the required shape of the net-cloth, which allows us to calculate the difference between the required position of the point and its present position at each point of actualization. After carrying out the corresponding calculation, the computer forms a numbered data array containing the direction and the required amount of displacement for each point of actualization. Next, the actual points are selected, the deviation from the required form of which exceeds the permissible value. After receiving a list of these points, the pump laser is positioned on the photocell of the corresponding point of actualization, thus supplying power. To transmit information about the desired direction and magnitude of the movement, it is supposed to use modulation of the pump laser beam, for which one of the information inputs of the controller of the point of actuation should be connected to the photocell. Then, the laser pulses can be read by the microcontroller and converted into a sequence of data bits, on the basis of which a control signal for the actuator will be generated. Wireless energy transfer is based on the use of a narrow beam of laser radiation.