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RESEARCH OF PV-BASED COMMUNICATION, NAVIGATION AND SATELLITE POWER SUPPLY
SYSTEMS

Abstract

High-efficiency solar PV systems are mainly used in power supply systems of satellite and communication systems. There are a number of pros and cons to solar power generation in space. PV systems operate in space at prices equal to the direct solar constant, although this is not the case on Earth. There is also no problem with solar energy systems heating up in space due to high temperatures, resulting in reduced efficiency. However, in space, PV systems are exposed to high radiation and shocks from space debris. Power supply of satellite systems is provided by PV or radioisotope thermoelectric generators. However, radioisotope thermoelectric generators are very expensive and the safety is not high. However, these generators are quite heavy. Radiation of PV systems, power generation, operation of the opening and closing mechanism are subject to changes over time, and it is very important to study them and repair them in the open space based on the results of this research. In addition, the energy batteries of PV systems should be studied. Currently, PV systems are being developed in the form of nanoparticles. The efficiency factor of these systems is 50-52%. The current study examines the study of high-efficiency PV systems in the power supply system of communications, navigation, telecommunications, military or other satellites. Here, the issues of generation, storage and use of electricity depending on the orbit of the satellite and time are considered. Changes in the generation characteristics of the PV system at 1370 W/m² of the solar constant and the movement of the satellite were studied. Volt-ampere characteristics were considered taking into account the temperature factor during the operation of PV systems. Then, technological innovations were proposed to ensure that the efficiency of solar energy systems does not decrease over time.