ҚАЗАҚСТАН РЕСПУБЛИКАСЫ БІЛІМ ЖӘНЕ ҒЫЛЫМ МИНИСТРЛІГІ
Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

ЖАС ҒАЛЫМДАР КЕҢЕСІ

Студенттер мен жас ғалымдардың «ҒЫЛЫМ ЖӘНЕ БІЛІМ - 2016» атты XI Халықаралық ғылыми конференциясының БАЯНДАМАЛАР ЖИНАҒЫ

СБОРНИК МАТЕРИАЛОВ XI Международной научной конференции студентов и молодых ученых «НАУКА И ОБРАЗОВАНИЕ - 2016»

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The proceedings are the papers of students, undergraduates, doctoral students and young researchers on topical issues of natural and technical sciences and humanities.

В сборник вошли доклады студентов, магистрантов, докторантов и молодых ученых по актуальным вопросам естественно-технических и гуманитарных наук.

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28 транспондеров искусственного спутника земли Казсат-3 могут обеспечить связью всю территорию Казахстана (сотовая связь, телевидение, радиовещание, интернет и космическая связь). Если нажать на сигнальную цифру или на мультиплексор, то через один транспондер на одной частоте можно отправить несколько потоков звуковых и видеоинформаций.

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Подсекция 1.2 Радиотехника, электроника и телекоммуникации

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ELECTRONIC MONITORING SYSTEM FOR MOVEMENT OF THE SUN "Sunflower"(Sun tracker): new ways to improve the efficiency of solar panels using a hub and the collector

Seiten Rais
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Student of group RET-34

The relevance of a subject and research project: The relevance of research project is that Kazakhstan headed for the development of renewable and alternative energy sources, first of all solar energy and wind power.

The purpose of the research project is aspiration to development of electronic control and monitoring systems of alternative energy sources (AES) and renewable energy sources (RES), solar energy refers to the both types of them.

Solar energy is one of the most promising areas of renewable energy sources. The Sun sends to the Earth a huge amount of energy. But while the main "flaw" of solar radiation is that it is "smeared" across the globe. There are only 100 mW of heat energy on a square centimeter of the surface perpendicular to the rays of the sun. So it is too little. But if solar energy of the area of one square meter is concentrated in 1 square centimeter area, it will produce total amount of energy equal to 1 kW.

The problem of the process of implementing electronic means in innovative projects of our time around the world is being studied, as well as an attempt of establishing the practice of their application in the development of Kazakhstan inventors. So following problems must be solved:

1) research the scientific side of the problem of increasing the efficiency of solar cells;

2) research experimental and practical side of the problem;

3) develop the recommendations for the implementation of advanced electronic technology of monitoring and control in alternative energy sources and renewable energy sources modern innovations.

Research methods. The research method is based on the physical and computer modeling, designing and constructing an innovative technology based on electronics, nano-electronics with future implementation in heating energy.

The project studies P1 and P2 problems associated with an increase of the efficiency of solar panel, which are viewed from two different perspectives – optical efficiency and electronically

controlled solar energy flow management. Implementation of these two approaches will give a 3-5% increase in the efficiency of solar panel:

P1: The increase of the efficiency of solar panels

Purpose of the problem # 1: The increase of the efficiency of the solar panel by separation and removal of the long-wave range of the solar radiation, which is known for the photoelectric threshold being not converted into electricity and, in fact, overheating solar panel, its decreasing its efficency, while short-wave part being absorbed by solar panel.

Relevance: an effective increase of the efficiency of solar panels.

The main hypothesis of the problem #1: heating of solar panels reduces the efficiency.

An approach to the solution of P1 is based on the use of the optical reflectivity of the diffraction grating, for example, echelette. It reflects 80% of solar energy of one octave, while having a maximum angular dispersion. Orthogonal gratings in the form of pyramids are also being considered.

Methods of solution of P1:

1. The spectral decomposition of light by using diffraction gratings.

2. Decomposition of the spectrum of visible light through various types of prisms. A location of the necessary range of frequencies.

P2: Electronic "sunflower" system which tracks the movement of the sun as a source of clean energy emission.

Purpose of the problem # 2: Creating an electronic "sunflower" system with an ability to accurately track the movement of the sun as a source of clean energy, the consumption of which started long ago, but with efficiency rate still being low.

Relevance: The problem arose in observation of nature's methods of efficiently gathering solar power , namely from the phenomenon of sunflowers tracking the movement of the sun.

Main hypothesis Problem #2: A task of creating an electronic "sunflower" system with an ability to accurately track the movement of the.

An approach to the solution of P2: To create an experimental electronic mini model of "Sunflower" system, which has already been started by a team of researchers and implementers of the project.

Methods of solution of P2: computer simulation, design and construction, and also methods of electronics.

	Task:	Expected result:
1	Defining characteristics of the solar cell.	The main characteristics of a solar cell will be determined.
2	Dividing the spectrum of sunlight into two parts.	Separation of the solar radiation spectrum by means of grating or other devices.
3	Placement: develop an overall structure of a solar cell.	Calculating the size of solar cells: the angles, the size of the grid, as well as accommodation.
4	Assembling of the device.	Selection of materials for the manufacture.
5	Creating a "Sunflower" mini model to solve the problem P2	"Sunflower" mini model for experiments tracking the movement of the sun as a source of clean energy

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