QUYOSH KONSENTRATORLARI

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Abstract: Today, the demand for electric energy is increasing, and traditional fuels are not inexhaustible. That is why we are trying to find different ways to get electricity from renewable energy sources. One of these methods is to obtain electricity through solar concentrators. Using theoretical data, we can see the possibilities of obtaining electricity from solar concentrators.

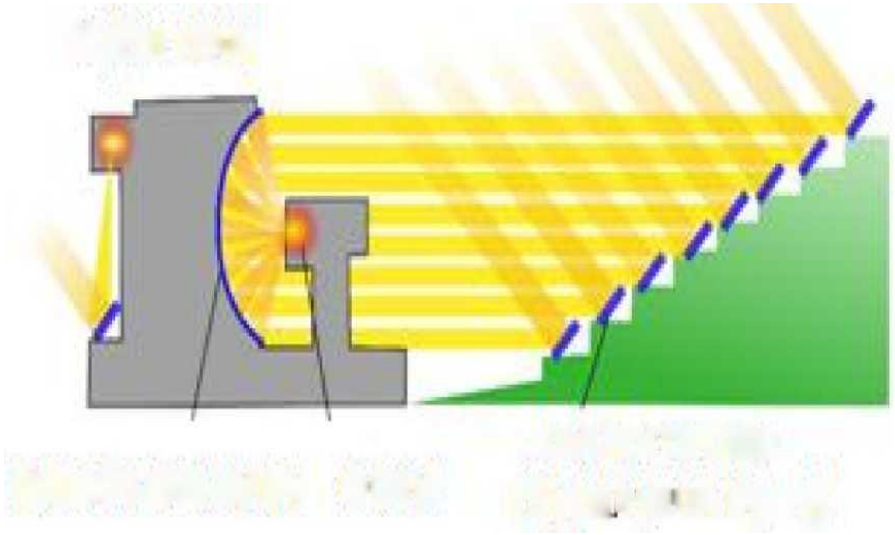
Key words: solar concentrators, temperature, radiation, parabolic concentrators, Stirling engine, electric current, voltage.

Introduction

The use of energy in various forms plays an important role in global economic development and industrialization. Solar energy is one of the important sources of energy to meet the growing demand in the process of sustainable development and global climate change management, as it is a free, unlimited, environmentally friendly source of energy. One of the most expensive types of energy today is thermal energy [1-8]. This is due to the specific features of its production and the constant increase in fuel prices, the low efficiency of thermal power plants due to the multiple conversion of thermal energy in heat exchangers, the efficiency of which in the process of delivering heat to the consumer is approximately 40-70%. A large solar furnace located at an altitude of 1050 meters in the foothills of the Parkent district of the Tashkent region is useful in these studies [9-11]. A picture of this structure is presented in Figure 3.

Figure 1.3. A large solar furnace located at an altitude of 1050 meters in the foothills of the Parkent district of the Tashkent region.

This structure can be used to create a controlled temperature in the furnace of up to 3000oC per day from solar energy during the day. In this case, parabolic mirrors with a base of 54-54 meters and a diameter of 1.2 meters form a directed beam. In the center there is a research center, where the metal melting process is monitored, behind which there is a mirror cloth [12-15]. The number of mirror elements in the cell is 10,700. Figure 5.



The light coming from the sun is directly fed to it at certain angles by 62 heliostats with a volume of 6.5-7.5 meters. Figure 1.5.

Figure 1.5. 62 heliostats with a volume of 6.5-7.5 meters.

The tower opposite the furnace in this structure is a technology center, as well as a control of the duration of the temperature effect and the formation of any beam from 800 to 3000 C. First of all, such a solar furnace is definitely not for simple metal melting, although it can perform such a function, the main purpose of the complex is scientific research. The use of a large solar furnace to melt ceramic serpentine found in the Kumushkon Mountains of the Tashkent region and produce heat-resistant refractory ceramic tiles from it justifies the technical and economic indicators of organizing production to optimize import-substituting ceramics based on local raw materials [15-17].

The imported porcelain tiles are different from the imported ceramic tiles made from local raw materials in a large solar plant in terms of the cost and quality level. A new system for controlling the technological process of manufacturing heat-resistant ceramic tiles, which ensures the rational use of renewable energy resources according to needs, is the use of a large solar plant. A new design for the production of ceramic tiles based on local raw materials in a large solar plant has been developed, and based on experimental studies of this design, it was possible to reduce electricity consumption in the operating mode of porcelain tile production. Now let's look at the incidence of solar radiation on the Earth's surface. The rays of the sun falling on the Earth are not ideally parallel to each other. Since the Sun is much farther from the Earth and its diameter is 109 times larger than the

Earth's, its angular diameter is 320. Therefore, the sun's rays fall on any point on the surface of the paraboloid reflector at an angle of at most φ0=320 from any point on the Sun [18-24].

Conclusion

The Parkent solar concentrator is one of the largest solar energy research facilities in Uzbekistan. This facility is located in the Parkent district of the Tashkent region and was built in the 1980s during the former USSR for the purpose of scientific and practical study of solar energy. The solar concentrator is notable for its unique design and large energy potential. This facility conducts research, tests new materials, and studies technologies for converting solar energy into electricity by thermal means. At the same time, the Parkent solar concentrator is the only such facility in Uzbekistan and Central Asia where international cooperation projects on innovative and sustainable energy solutions are also being implemented. Testing high-temperature resistant materials, concepts for hydrogen energy production, and development of technological solutions for solar power plants are all key activities carried out within the framework of this concentrator. The facility is of great strategic importance for the science and energy sectors and plays an important role in Uzbekistan's promising green energy projects.

References

1. Khamidillaevich, Y. A. (2023). PARAMETERS OF OPTOELECTRONIC RADIATORS AND SPECTRAL CHARACTERISTICS IN DIFFERENT ENVIRONMENTS. *Journal of Integrated Education and Research*, *2*(4), 81-86.

2. Халилов, М. Т., & Юсупов, А. Х. (2023). МАКСВЕЛЛНИНГ УЗЛУКСИЗЛИК ТЕНГЛАМАСИНИНГ БАЁН ҚИЛИШ УСУЛИ. *Journal of Integrated Education and Research*, *2*(4), 77-80.

3. Xamidullayevich, Y. A., & Xalimjon o'g, T. N. Z. (2023). O 'ZBEKISTON SHAROTIDA SHAMOL ELEKTR STANSIYALARINI O 'RNATISH IMKONIYATLARI. *Journal of new century innovations*, *25*(1), 27-29.

4. Юсупов Абдурашид Хамидиллаевич, & Хамдамова Наргизой Хамидуллаевна. (2024). ЭЛЕКТРОМАГНИТ ИНДУКЦИЯ МАВЗУСИНИ ИНТЕРФАОЛ МЕТОДЛАР БИЛАН ЎҚИТИШ. *PEDAGOGS*, *48*(1), 43–50. Retrieved from https://pedagogs.uz/index.php/ped/article/view/575

5. Olimov, L. O., & Yusupov, A. K. (2021). The Influence Of Semiconductor Leds On The Aquatic Environment And The Problems Of Developing Lighting Devices For Fish Industry Based On Them. *The American Journal of Applied Sciences*, *3*(02), 119-125.

6. Xalilov, M. T., & Yusupov, A. K. (2022). THE METHOD OF EXPRESSING MAXWELL'S EQUATIONS IN AN ORGANIC SERIES ACCORDING TO THE RULES, LAWS AND EXPERIMENTS IN THE DEPARTMENT OF ELECTROMAGNETISM. *European International Journal of Multidisciplinary Research and Management Studies*, *2*(10), 09-15.

7. Юсупова, У. А., & Юсупов, А. Х. (2022). ЎЗГАРМАС ТОК ҚОНУНЛАРИ БЎЛИМИНИ ЎҚИТИЛИШИДА НАМОЙИШ ТАЖРИБАСИНИНГ ЎРНИ. *PEDAGOGS jurnali*, *17*(1), 210-214.

8. Olimov Lutfiddin Omanovich, Akhmedov Alisher Khamidovich, & Yusupov Abdurashid Khamidillaevich. (2022). SCHEME OF HIGH VOLTAGE GENERATION USING SEMICONDUCTOR TRANSISTORS. *European Scholar Journal*, *3*(5), 42-49. Retrieved from https://scholarzest.com/index.php/esj/article/view/2206

9. Юсупов Абдурашид Хамидуллаевич, & Турсунов Навроз. (2023). ИСПОЛЬЗОВАНИЕ ЭНЕРГИИ ВЕТРА В МИРЕ И В УЗБЕКИСТАНЕ . *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *22*(2), 83–86. Retrieved from https://newjournal.org/01/article/view/6797

10. Abdurashid Khamidillayevich Yusupov Associate professor, Andijan machine-building institute, Uzbekistan. (2023). THE METHOD OF EXPLANATING THE ELECTROMAGNETIC INDUCTION PHENOMENON. Zenodo. https://doi.org/10.5281/zenodo.10201792

11. Yusupov Abdurashid Xamidullayevich, & Qodiraliyev Nursaid Botirali o`g`li. (2024). QUYOSH SPEKTRI VA FOTOELEKTRIK MATERIALINING YUTILISH SPEKTRI O‘RTASIDAGI NOMUVOFIQLIKNING TA’SIRINI KAMAYTIRISH. *Лучшие интеллектуальные исследования*, *14*(2), 64–71. Retrieved from http://web-journal.ru/index.php/journal/article/view/2891

12. Yusupov Abdurashid Khamidullayevich, & Artikov Dilshodbek Khushbaqjon ogli. (2024). PHOTOVOLTAIC EFFECTS AND THEIR EFFECTIVE USE. *Лучшие интеллектуальные исследования*, *14*(2), 21–27. Retrieved from http://web-journal.ru/index.php/journal/article/view/2884

13. Yusupov Abdurashid Xamidullayevich, & Yuldasheva Saodatkhan Sultanbek kizi. (2024). PPLICATION OF PHOTOVOLTAIC EFFECTS TO ENERGY-SAVING MATERIALS COMPONENTS OF THE STRUCTURE AND SOLAR CELLS. *Лучшие интеллектуальные исследования*, *14*(2), 105–109. Retrieved from http://web-journal.ru/index.php/journal/article/view/2897

14. Yusupov Abdurashid Khamidillaevich, & Yuldasheva Saodatkhon Sultonbek kizi. (2024). APPLICATION OF PHOTOVOLTAIC EFFECTS TO ENERGY SAVING MATERIALS. *Лучшие интеллектуальные исследования*, *21*(2), 62–68. Retrieved from https://web-journal.ru/journal/article/view/5316

15. Yusupov Abdurashid Khamidullayevich, & Khakimov Ulugbek ogli. (2024). DEVICES COLLECTING SUNLIGHTS. *Лучшие интеллектуальные исследования*, *21*(1), 193–199. Retrieved from https://web-journal.ru/journal/article/view/5297

16. Yusupov Abdurashid Khamidullayevich, & Rozmamatov Oybek Dilshodbek ogli. (2024). OBTAINING ELECTRICAL ENERGY USING DEVICES COLLECTING SUNLIGHTS. *Лучшие интеллектуальные исследования*, *21*(1), 187–192. Retrieved from https://web-journal.ru/journal/article/view/5296

17. Yusupov Abdurashid Khamidillaevich, & Artikov Dilshodbek Xushbakjon ogli. (2024). APPEARANCE OF PHOTOVOLTAIC EFFECT IN POLYCRYSTAL SILICON BASED RECEIVER. *Лучшие интеллектуальные исследования*, *21*(1), 179–186. Retrieved from https://web-journal.ru/journal/article/view/5295

18. Khamidillaevich, Y. A., & Abdumalik, T. (2024). HIGH TEMPERATURE SOLAR CONCENTRATORS. *Лучшие интеллектуальные исследования*, *21*(1), 200-206.

19. Kodirov, D., Makhmudov, V., Normuminov, J., Shukuraliev, A., Begmatova, N., & Abdurashid, Y. (2024). Determination of the optimal angle for high efficiency of solar panels in Uzbekistan. In *E3S Web of Conferences* (Vol. 563, p. 01008). EDP Sciences.

20. Lutfiddin Omanovich Olimov, ., & Abdurashid Khamidillaevich Yusupov, . (2022). DETERMINATION OF EFFICIENT OPTICAL SOURCES OF AIR PROPAGATION FOR FISHERIES BIOPHYSICAL DEVICES. European International Journal of Multidisciplinary Research and Management Studies, 2(10), 1–8. Retrieved from https://inlibrary.uz/index.php/eijmrms/article/view/23357

21. Olimov, L. O., & Yusupov, A. K. (2021a). TEMPERATURE DEPENDENCE OF TRANSISTOR CHARACTERISTICS OF ELECTRIC SIGNAL AMPLIFICATION IN OPTOELECTRONIC DEVICES. Theoretical & Applied Science, 8, 169–171.

22. Yusupov, A. K. (2021). Creating a biophysical trapping device based on an optical radiation source with a light-emitting diode. ACADEMICIA: An International Multidisciplinary Research Journal, 1530-1536.

23. Olimov Lutfiddin Omanovich, Y. (2020). Problems Of Implementation Of Semiconductored Leds For Fishery Lighting Devices. The American Journal of Engineering and Technology, 189–196.

24. Oripova Dilnoza Karimjon kizi, & Yusupov Abdurashid Khamidillaevich. (2024). PHENOMENON OF PHOTO EFFECT IN SEMICONDUCTORS. *JOURNAL OF NEW CENTURY INNOVATIONS*, *67*(4), 132-137. https://scientific-jl.org/new/article/view/7623