

# Wireless Power Transmission through Invisible Laser

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**Abstract**— The aim of this paper is to represent the concept of wireless power transmission using microwave or laser. It contains satellite based solar power system (SPS) which is used for collection of solar power in the space. So, it can be used on earth. Array of panels are placed in the ground facing the sun at the earth based solar power collection. It collects sun's energy in day time. On the large satellite, huge solar panels are fitted which collect the solar energy and represent in orbit. Also the sun energy collection is do not affected by day-night cycle, temperature changes, gases which present in earth's atmosphere. It gives large amount of power and it is renewable energy. Due to this rate of electricity rate will be reduces.

**Key words:** Image Wireless Power Transmission, Solar Power Satellites, Laser, ARM Controller

## I. INTRODUCTION

The Electricity is one form of energy. Also the demand of electricity is day by day increasing. Solar energy is available in the form light and heat in the space. Satellites are mainly used to collect the solar energy. It consists of sunlight of 24 hours a day for particular years. When the sun is in not view, no need of costly storage device. The heat which is not used, it radiated into space. Electricity is having high demand. Normally, the 60 % energy is generated by using coal-fired station. Due to this carbon dioxide is generated. This will affects on the atmosphere. If the change in the climate, the generation system must need to be changed.

For achieving the high demand of power and reduction of CO<sub>2</sub>, we must me.et demand, efficiency, and reliability. It can be done by using solar, wind, tidal and any other. Energy requirements are generated because of population, life style, applications. So lot of energy consumed because of electric power accounts. More power is loss during the transmission. The conventional methods are unable to provide the increasing the demand of electric power. 26% to30% loss is generated because resistance of the wire or cables. By using the high strength composite over head conductor and underground cables. Which use at high temperature super conductor the efficiency of the power transmission can be improved up to specific level. So we can say that the system of electrical transmission is 70% to 74% efficient.

It is quite different from that on the earth solar energy in the space free from weather conditions. Large amount of power is generated in the space because of bulk photovoltaic array and it transmits to the earth using microwaves. When the solar energy is transmitting from sun it loss due to the reflections and absorptions. The solar energy can be absorbs easily from geosynchronous orbit. Where the period of earth's rotation is similar to the rotation of any orbit. In the space photovoltaic cells generate the 5% to10% power more than at ground. Generally, solar cells are placed in the space because it has more advantages that it place in ground. The photovoltaic cell converts energy in DC energy. The DC

is converted into microwave energy by using Rectenna or LASER. Practical implementation of Rectenna is very difficult.

## II. BLOCK DIAGRAM

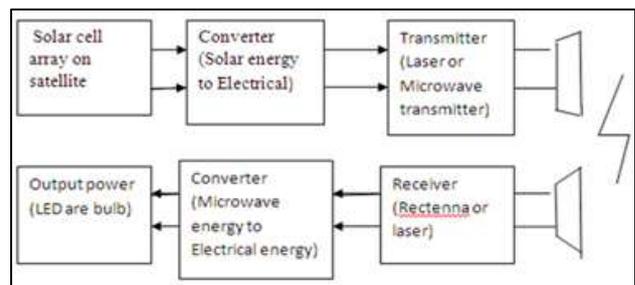


Fig. 1: Block Diagram

Nowadays this block diagram can be use for wireless power transmission.

### A. Block Diagram and Description

This is diagram for wireless power transmission. Solar panels mounted on the satellite, which capture the electromagnetic waves. For providing input to the solar panel, we can use bulb as an input. When the bulb's light fall on the solar panel, it will absorbs the light. And the solar energy converts into electrical energy. Here, we can use input as (5-10) volts. If more amount of input voltage is applied, it converts more energy in the form of electrical energy.

Again we have to convert electrical energy into microwave energy. Microwave frequency having the frequency range from 1GHz to 30 GHz and wave length from 30cm down to 1cm. It transfers high power from one place to another place, two places being in line of sight usually. Microwave transmission refers to the technology of transmitting information by use of radio waves whose wavelength are conveniently measured in small numbers of centimeter these are called as microwaves.

## III. WIRELESS POWER TRANSMISSION

Then Solar based wireless power transmission system consist of 3 steps

- 1) Solar energy converts into DC electricity.
- 2) After DC electricity it converts into microwave.
- 3) For that purpose laser can be used.
- 4) Again the transmitted laser beam falls on photo detector, it detects light and power can be transmitted wirelessly.

### A. Input(Bulb)

Here the bulb is used as an input source. It is available in different ranges, but we use here 100Watt's bulb.

Bulb emits the light, and those light rays are falls on the solar panel.

### B. Solar panel

Title Solar panels are photo voltaic cells. We are try to make the proto type of this model. Here we use Solar panel which is operates on 10Watt.

### C. Laser selection

For transmitting the power any laser can be used. Mainly it selects according to efficiency of the laser the generation process and absorption, Also the conversion process of laser to electrical. For that purpose we use here invisible laser having range 850-1550nm For converting the DC into microwave Laser can be used. Laser produces high focus beam of light. Also it is having shorter wavelength. Laser have become one of the world most important technical used in industries ranging from information technology to telecommunication, medicine, consumer electronics, military application and manufacturing. The light wavelengths are packed.

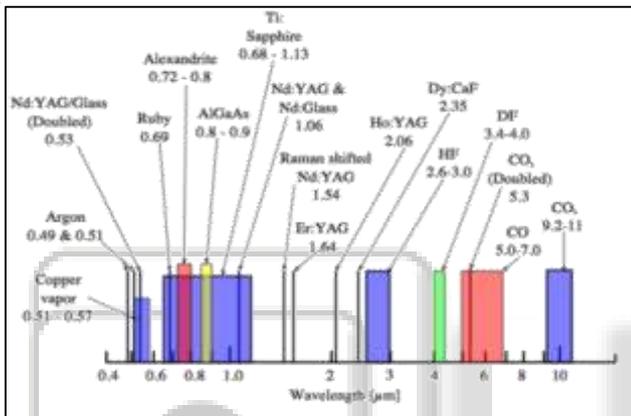


Fig. 1: Spectral output of several types of lasers

In above figure shows the different spectral laser output

### D. ADC

We are using LPC2138, it is having 10 bit inbuilt ADC. Basically it used for displaying the output voltage. At the output we get the digitised output. It is nothing but wirelessly transmitted power. An ADC may also provide an isolated measurement such as an electronic device that converts an input analog voltage or current to a digital number proportional to the magnitude of the voltage or current.

### E. Laser Power Transmission

Optical an infrared frequency are generated by layers which has phase coherent electromagnetic radiation using external energy source like pumping excited state of lasant. Which creates inversion in normal distribution of energy state.

In resonant optical cavity the photon which is stimulated by emission an amplified as standing waves. In fiber optic and free space communication DC to Laser converters are mostly used. The concentration ratio of laser beam is dependent on the size of laser medium an absorption ratio by using an electronic beam steering system laser avoid moving parts on the space.

## IV. EXPECTED RESULT

In this paper we explain the concept of wireless power transition. It gives overview of research related to the laser. It will be more efficient in the generation of power. Also this

power can be used in different field. The amount of CO<sub>2</sub> gas can be reduced and the problem of pollution can be minimized.

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