GENERATION OF POWER IN CONSTRUCTION SITE THROUGH GRAVITY AND KINETIC ENERGY

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Abstract - Conserving energy has become the biggest issue in present scenario. Due to the development modernization the electricity demand is increasing at high extent[1]. To fulfil this demand globally which is without harmful effect on environment is possible by using gravity power generation. The reason behind generating power by using gravity is that it is available all over the earth[2]. Comparing to the other sources like chemical, thermal and other sources gravity is weak, is scalable. This weakness is due to uniformity, or steady state of our interactions with gravity.As gravity is weak as compared to the other sources, it cannot be efficiently converted into electrical energy or in the other form[3]. The concept of gravity power generation is simple. The Earth pulls everything towards itself. The pull seems to be massive. Gravitational force is exerted on objects even when they are not airborne i.e the object can be on the ground and gravitational force still exit on it. This force pulls them and keeps them down[4]. Gravity is the force that is present on the earth at every instant of time , hence with suitable mechanism it can be used as a source to generate Electrical energy[5]. An arrangement is made in such a way that the Kinetic Energy of a body due to the gravitational force is converted into electrical energy.

Key words-gravitational force,kinetic energy

I.INTRODUCTION

Now a days due to the effects of pollution and global warming there is a need for generating power from renewable sources. Due to the availability of gravity all over the earth, abundant and consistent it is very suitable to generating power by using gravity[1]. Energy demand is increasing day by day with rapid growth in industrialization as well as modernization. But the energy resources are gradually decreasing at high extent. Within a few years the energy resources will be finished and hence there will be lack of fuel (coal, wood, water, etc.) for power generation[2]. The other renewable sources such as solar, wind, biomass etc are available only for a particular duration of time during the day and night[3]. Therefore the gravity power generation is one of the method to generate power which fulfil energy demands and requirements of present time.It is possible to deflect gravitational action away from an object so that the object is partially deviated. That effect makes it possible to extract energy from the gravitational field, which makes the generation of gravitational electric power technologically feasible.Such plants would be near about similar to hydro-electric plants[6].Gravitational electric power plant has advantages over the hydro-electric

plant, such as not needing of fuel and not polluting the environment[7].However, the gravitational electric plant would be much smaller than hydro-electric plants. The location of that plant would not be restricted to suitable water elevations and gravitational electric power plants and their produced energy would be much expensive[8].If the gravitational power electric generation comes under operation and working then it can replace all existing nuclear and fossil fuel plants and it would essentially solve the problem of global warming to the extent it is caused by fossil[3].The energy sources for man are drying up. The era of fossil fuels is going to end very soon. Scientists are now working on to find new renewable sources of energy[4]. Along with renewable energy sources like light and wind comes gravity.Gravity is a phenomenon that existed from the very beginning of the universe but only discovered by Sir Isaac Newton not more than 400 years ago[5]. Recently scientists started generating energy from gravity

II.PRINCIPLE

The basic concept of a gravity power generating mechanism is simple. When a body goes down from a higher altitude to

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a lower one its potential energy is converted into kinetic energy via linear motion. This motion is converted circular motion and is then converted to electricity using a dynamo
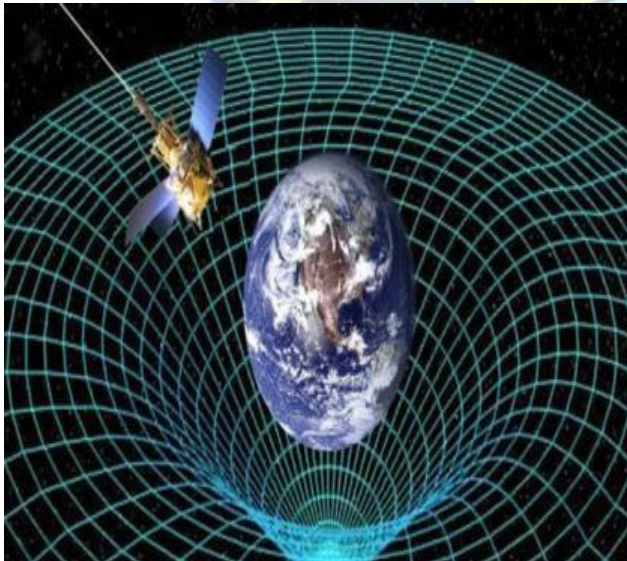
STRENGTH OF GRAVITY

Gravity is a pretty awesome fundamental force. If it wasn't for the Earth's comfortable 1 g, which causes objects to fall towards the Earth at a speed of 9.8 m/s², we'd all float off into space. And without it, all us terrestrial species would slowly wither and die as our muscles degenerated, our bones became brittle and weak, and our organs ceased to function properly.

So one can say without exaggerations that gravity is not only a fact of life here on Earth, but a prerequisite for it. However, since human beings seem intent on getting off this rock – escaping the "surly bonds of Earth", as it were – understanding Earth's gravity and what it takes to escape it is necessary. So just how strong is Earth's gravity?

A .Definition:

To break it down, gravity is a natural phenomena in which all things that possess mass are brought towards one another – i.e. asteroids, planets, stars, galaxies, super clusters, etc. The more mass an object has, the more gravity it will exert on objects around it. The gravitational force of an object is also dependent on distance – i.e. the amount it exerts on an object decreases with increased distance.

Artist's impression of the effect Earth's gravity has on spacetime. Credit: NASA

Gravity is also one of the four fundamental forces which govern all interactions in nature (along with weak nuclear force, strong nuclear force, and electromagnetism). Of these

forces, gravity is the weakest, being approximately 10^{38} times weaker than the strong nuclear force, 10^{36} times weaker than the electromagnetic force and 10^{29} times weaker than the weak nuclear force.

As a consequence, gravity has a negligible influence on matter at the smallest of scales (i.e. subatomic particles). However, at the macroscopic level – that of planets, stars, galaxies, etc. – gravity is the dominant force affecting the interactions of matter. It causes the formation, shape and trajectory of astronomical bodies, and governs astronomical behavior. It also played a major role in the evolution of the early Universe.

It was responsible for matter clumping together to form clouds of gas that underwent gravitational collapse, forming the first stars – which were then drawn together to form the first galaxies. And within individual star systems, it caused dust and gas to coalesce to form the planets. It also governs the orbits of the planets around stars, of moons around planets, the rotation of stars around their galaxy's center, and the merging of galaxies.

B .Universal Gravitation and Relativity:

Since energy and mass are equivalent, all forms of energy, including light, also cause gravitation and are under the influence of it. This is consistent with Einstein's General Theory of Relativity, which remains the best means of describing gravity's behavior. According to this theory, gravity is not a force, but a consequence of the curvature of spacetime caused by the uneven distribution of mass/energy.
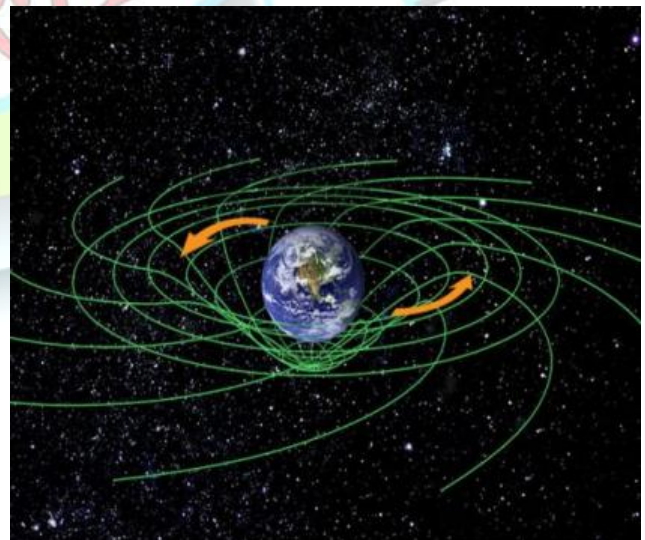

Fig.Artist's impression of the frame-dragging effect in which space and time are dragged around a massive body.

The most extreme example of this curvature of spacetime is a black hole, from which nothing can escape. Black holes are usually the product of a supermassive star that has gone supernova, leaving behind a white dwarf remnant that has so much mass, it's escape velocity is greater than the speed of light. An increase in gravity also results in gravitational time dilation, where the passage of time occurs more slowly.

For most applications though, gravity is best explained by Newton's Law of Universal Gravitation, which states that gravity exists as an attraction between two bodies. The strength of this attraction can calculated mathematically, where the attractive force is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

C .Earth's Gravity:

On Earth, gravity gives weight to physical objects and causes the ocean tides. The force of Earth's gravity is the result of the planets mass and density – 5.97237×10^{24} kg (1.31668×10^{25} lbs) and 5.514 g/cm^3, respectively. This results in Earth having a gravitational strength of 9.8 m/s² close to the surface (also known as 1 g), which naturally decreases the farther away one is from the surface.

In addition, the force of gravity on Earth actually changes depending on where you're standing on it. The first reason is because the Earth is rotating. This means that the gravity of Earth at the equator is 9.789 m/s^2, while the force of gravity at the poles is 9.832 m/s^2. In other words, you weigh more at the poles than you do at the equator because of this centripetal force, but only slightly more.

Finally, the force of gravity can change depending on what's under the Earth beneath you. Higher concentrations of mass, like high-density rocks or minerals can change the force of gravity that you feel. But of course, this amount is too slight to be noticeable. NASA missions have mapped the Earth's gravity field with incredible accuracy, showing variations in its strength, depending on location.
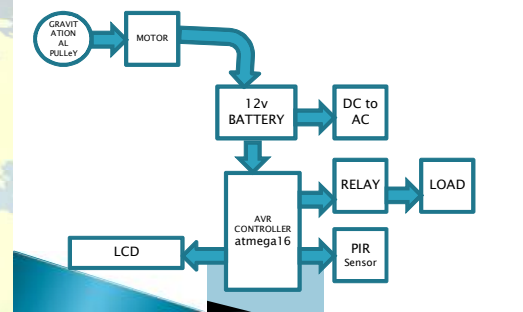
Gravity also decreases with altitude, since you're further away from the Earth's center. The decrease in force from climbing to the top of a mountain is pretty minimal (0.28% less gravity at the top of Mount Everest), but if you're high enough to reach the International Space Station (ISS), you would experience 90% of the force of gravity you'd feel on the surface.

However, since the station is in a state of free fall (and also in the vacuum of space) objects and astronauts aboard the ISS are capable of floating around. Basically, since everything aboard the station is falling at the same rate towards the Earth, those aboard the ISS have the feeling of being weightless – even though they still weight about 90% of what they would on Earth's surface.

Earth's gravity is also responsible for our planet having an "escape velocity" of 11.186 km/s (or 6.951 mi/s). Essentially, this means that a rocket needs to achieve this speed before it can hope to break free of Earth's gravity and reach space.

III. WORKING

BLOCKDIAGRAM

A chain is used to suspend the load across the pulley .The other end of the chain is mounted on the motor shift.Initially a small external power is given to the DC machine so as raise the load.When the load reaches the destined height ,the relay opens as it hits the switch set up kept above.Then the load moves down [9].Now the Dc machine converts mechanical energy into electrical energy.The power produced will be stored in the battery which is then given to the DC to AC converter from which it is delivered to the mains[10]. In the construction site people will be moving When someone comes near the load ,the Passive Infrared Sensor senses it and gives the information to the AVR controller,which causes the relay to open so that load may be suspended at that position.The LCD displays as "someone crosses ".Instead of LCD ,alarm can also be used .

IV.PRODUCT DESCRIPTION

The number of product to be using for this project of gravity force of power generation is as followed

1 Gravity pully

2   12v battery

3   Load

4   Atmega16

5   PIR Sensor

6   Relay

DC MINI MACHINE

PERFORMANCE OF DC GENERATOR AND DC MOTOR

Any DC motor with permanent magnets can easily be a generator. It doesn't matter whether it is brushed or not; brushless motors make great generators but you will need to add a rectifier to get a DC output.
If the motor has a separate field winding instead of a permanent magnet, you will need to energise that winding from an external DC source, e.g. a battery.

For example, a car alternator has DC slip-rings (not a commutator!) to supply a small field current to the rotor, and a three phase (usually) stator winding. To get anything out, you must energise the field winding, and then you get 3-phase AC from the stator, which must be rectified in order to obtain DC. You can control the output power (and therefore the load the alternator places on the shaft) by modulating the field current.

If it's a "series wound" DC motor, I don't think it will generate unless part of the motor chassis is residually magnetised. That style of motor (only two terminals connect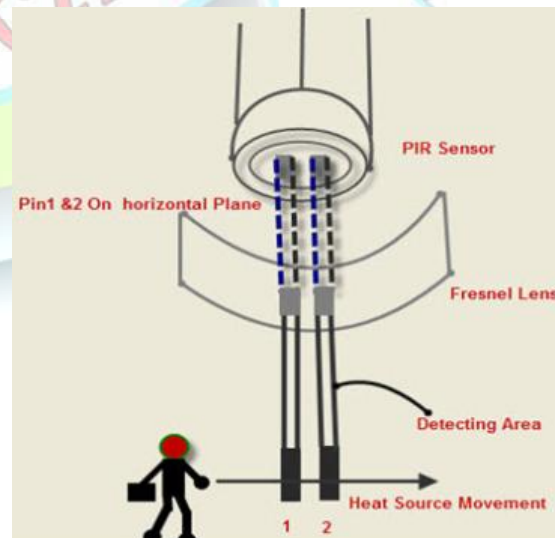ing to two windings and no permanent magnets) is generally not appropriate for generation because you have no guarantee it will do anything, and no good way to control the generated power/load.

PIR sensor

PIR sensor detects a human being moving around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m.PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiationPIR sensors are incredible, they are flat control and minimal effort, have a wide lens range, and are simple to interface with. 5 Features FEATURES:

1.   Complete with PIR, Motion Detection.
2.   Dual Element Sensor with Low Noise and High Sensitivity.
3.   Supply Voltage – 5V.
4.   Delay Time Adjustable.
5.   Standard TTL Output.

A PIR sensor detects the infrared light radiated by a warm object. It consists of pyro electric sensors which introduce changes in their temperature (due to incident infrared radiation) into electric signal. When infrared light strikes a crystal, it generates an electrical charge.

Relay is an electromagnetic device which is used to isolate two circuits electrically and connect them magnetically. They are very useful devices and allow one circuit to switch another one while they are completely separate. They are

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often used to interface an electronic circuit (working at a low voltage) to an electrical circuit which works at very high voltage. For example, a relay can make a 5V DC battery circuit to switch a 230V AC mains circuit. Thus a small

sensor circuit c
an drive, say, a fan or an electric bulb.

ATmega16 is an 8-bit high performance microcontroller of Atmel's Mega AVR family with low power consumption. Atmega16 is based on enhanced RISC (Reduced Instruction Set Computing, Know more about RISC and CISC Architecture) architecture with 131 powerful instructions. Most of the instructions execute in one machine cycle. Atmega16 can work on a maximum frequency of 16MHz.

ATmega16 has 16 KB programmable flash memory, static RAM of 1 KB and EEPROM of 512 Bytes. The endurance cycle of flash memory and EEPROM is 10,000 and 100,000, respectively.

ATmega16 is a 40 pin microcontroller. There are 32 I/O (input/output) lines which are divided into four 8-bit ports designated as PORTA, PORTB, PORTC and PORTD.

ATmega16 has various in-built peripherals like USART, ADC, Analog Comparator, SPI, JTAG etc. Each I/O pin has an alternative task related to in-built peripherals. The following table shows the pin description of ATmega16.

V.CONCLUSION

This method of power generation is pollution free and harmless to the environment.This type of power generation is applicable in all the seasons and the variations in the climatic condition does not affect the generation of power.Power consumption is also low. By such arrangements, the gravity power generation mechanism not only has the advantages such as: more simplified structure, higher conversion ratio and more environment-friendly but only needs a little starting energy to perform a long time energy conversion and stable energy output. The other main advantage of the gravitational power generation mechanism

is that it can independently generate electricity and it can be parallel connected to the wind power and the
solar power generation systems to generate electricity.

VI.FUTURE ENHANCEMENT

In future generation of power through gravity can also be obtained from various movement of the object .

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