

2013 臺灣國際科學展覽會 優勝作品專輯(國外作品)

作品編號 140048
參展科別 物理與太空科學科
作品名稱 Inverter
得獎獎項 四等獎

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ABSTRACT OF EXHIBIT

TAIWAN INTERNATIONAL SCIENCE FAIR

PURPOSE:

The purpose of making an Inverter which gets charged with the help of sound energy, produced by speakers for instance, and regenerative shock absorbers which are used in cars so that we can easily charge the inverter with the help of sources which we use in daily life.

PROCEDURE:

The regenerative shock absorbers are capable of generating electricity when a car moves over bumps. It works by hydraulic fluid passing through a turbine. When the fluid passes through turbine, the turbine turns a small generator and more power is created.

A piston is disposed for reciprocating motion within a cylinder as a vehicle's suspension system deflects. Hydraulic fluid passes through a hydraulic motor to turn its shaft. The hydraulic motor shaft is connected to an electric generator to generate electricity.

The second source of energy to charge the inverter is by the help of sound produced in day to day life. Some piezoelectric sensors attached to the board as soon there is a tap or any kind of vibration on the board these and convert them to electrical signals. This means that parasitic energy of busy roads, railroads, footpaths and runways near population centers can be converted into electrical energy that can run public lighting, or fed back into the grid.

DATA:

The data which have been collected with some experiments is that on an average piezoelectric can produce 330W of power.

- When sound pressure is around 62 dB, the frequency is of 102 Hz.
- Sound pressure is of 65 dB the frequency is of 500 Hz.

Another case when the regenerative shock absorbers come in contact with the piston it produces an average power of 340W-350W.

CONCLUSION:

With the usage of piezoelectric sensors and regenerative shock absorbers we can produce electricity at a very low cost for inverters; these inverters can provide electrical supplies to the house. The most important reason to make such kind of innovation is one because it is money efficient, second this can come in handy for those who can't afford to buy inverters at a very high cost and then when charging these inverter these people have to use their electrical supply!

評語

Converting the vibrating energy into stored energy is a nice approach, but need to produce more supporting data when estimating the energy gains.