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Microwave signals turned into electrical power

An electrical current capable of charging a mobile phone has been created from microwave signals.

A team from Duke University said the technology they had used had been as efficient as using solar panels.

The device they created used metamaterials, which capture various forms of wave energy and convert them for other applications.

In the future, satellite, sound or wi-fi signals could be "harvested", according to the US researchers.

"We're showing... these materials can be useful for consumer applications," said engineering student Alexander Katko.

Using fibreglass and copper conductors on a circuit board, the researchers converted microwaves into 7.3 volts of electricity. A USB charger, which is often used to recharge mobile phone batteries and cameras, provides about five volts.

"We were aiming for the highest energy efficiency we could achieve," said team member Allen Hawkes.

"We had been getting energy efficiency around 6-10%, but with this design we were able to dramatically improve energy conversion to 37%, which is comparable to what is achieved in solar cells."

Metamaterials are artificial materials that display properties not usually found in nature.

In future, the two students and their colleague Steven Cummer hope that the technology can be built in to mobile phones. This would allow the handsets to recharge wirelessly when not being used.

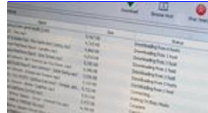
They also believe that it could help users living in remote areas without access to the power grid. They would be able to "harvest" the energy from signals generated by mobile phone towers.

"Our work demonstrates a simple and inexpensive approach to electromagnetic power harvesting," said Mr Cummer.

"The beauty of the design is that the basic building blocks are self-contained and additive. One can simply assemble more blocks to increase the scavenged power."

The full report will be published in the journal Applied Physics Letters in December.

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