Gadget recharging goes wireless

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[摘要] 14 November 2006,While electromagnetic radiation can be used to power a remote device, current technologies are often inefficient and sometimes dangerous. This is because the electromagnetic waves radiate in all directions from the power source and most of the energy is lost to the environment. These problems can be partially overcome by using highly-directional radiation such as laser light -- or electromagnetic induction, which operates at very short range. However, these techniques require the gadget to be in a specific location and therefore are not really convenient for charging a mobile phone left casually on a tabletop.
[关键词] electromagnetic radiation;power source;energy

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Soljacic and colleagues used theoretical calculations and computer simulations to propose a method that uses an electromagnetic field to couple the power source to the gadget to be charged. Energy is transferred to the gadget because its antenna resonates at the same frequency as the transmitter, while other objects in the room do not absorb energy because the -radiative energy transfer. In addition, much of the energy that is not absorbed by the gadget would be reabsorbed by the transmitter.
Gadget and power source each employ the same resonant structure, which is an antenna for exchanging energy. The researchers investigated two types of resonant structures --
a disk of dielectric material and a loop of wire bisected by capacitive plates. The simulations suggested that the loop would be a better choice under real
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world conditions because less energy would be absorbed by nearby objects including humans. Calculations suggested that energy transfer efficiencies of 15% or greater could be achieved, which the researchers claim is large enough for practical applications.
Indeed, Soljacic envisions a home of the future with a transmitter in every room, ensuring that all portable electronics devices are charged. Other household gadgets such as robotic vacuum cleaners could run off the power source. "In addition to consumer electronics, wireless energy could find industrial applications, for example powering freely
-roaming robots within a factory pavilion", he added. The MIT team now plans to demonstrate the new technology in the laboratory.