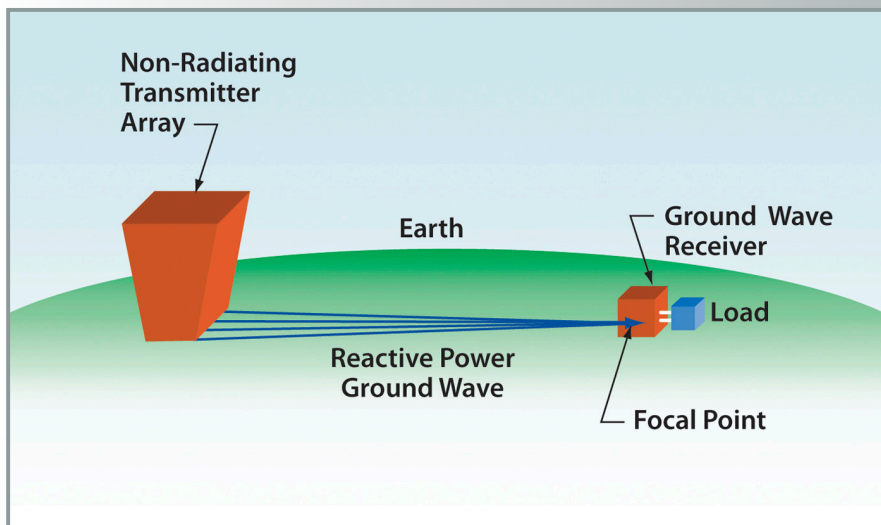


Directional Reactive Power Ground Plane Transmission

UT-B ID 200802202



Technology Summary

ORNL researchers have developed a pioneering power alternative to batteries using directional reactive power. Batteries are currently the primary option for powering mobile electronic equipment; however, batteries are heavy and battery life is limited. Reactive power is the phenomenon that occurs when alternating voltage and current are 90 degrees out-of-phase with respect to time. This phenomenon allows electrical transmission on a single wire without a return path.

The invention can transmit electrical power through the surface of the earth via electromagnetic ground waves. By using the Earth as a ground plane, the invention avoids any need for transmission wires. Any kind of electric device can be served by this method, including stationary or moving electric vehicles and electronic devices.

Advantages

- On demand electrical energy for mobile or fixed electronic devices
- Eliminates or reduces the need for batteries
- Eliminates wires, plugs, and all the apparatus for traditional electrical transmission
- Allows electrical energy to be focused to specific points
- Provides greater mobility by eliminating battery weight

Potential Applications

- Wireless electrical energy transfer systems
- Recharging electric vehicles and electronic devices
- Recharging or powering existing equipment from a power source located miles away

Patent

Charles W. Van Neste and Thomas Thundat, *Systems and Methods for Directional Reactive Power Ground Plane Transmission*, U.S. Patent Application 12/572,349, filed October 2, 2009.

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