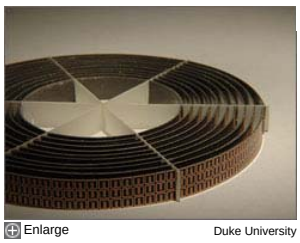
Invisibility cloak could become a reality

Updated 10/20/2006 8:20 AM ET



Enlarge Duke University

Made of fiberglass and copper, an experimental "cloak of invisibility" for microwaves is less than five inches across. A copper object placed in the middle of the coil cannot be "seen."

By Dan Vergano, USA TODAY

Look out, Lord Voldemort. Harry Potter's invisibility cloak just got a little closer to reality, scientists reported Thursday.

VIDEO: Duke demonstrates the invisibility cloak (RealPlayer) | **WATCH YOURSELF DISAPPEAR:** Someday, we'll all be invisible: Discuss at On Deadline

The work is very preliminary, but it could herald an era of effectively invisible "cloaked" devices, says study senior author David Smith of Duke University in Durham, N.C.

A prototype so far only hides objects from microwaves, not from visible light, so the human eye can still see the objects. But scientists say it shows the technology is feasible.

Here's how it works: Electromagnetic waves scatter and reflect when they strike objects, and the eye picks up this reflection to see. The new technology relies on materials that theoretically can bend electromagnetic waves, including visible light, around objects as if nothing were there.

Scientists created a cylinder, or "cloak," about 5 inches across, consisting of 10 fiberglass plates precisely etched with U-shaped copper divots to cancel reflections and shadows from microwaves.

The prototype, described in the journal *Science*, creates an electromagnetic "mirage" around objects, bending microwaves just enough to cancel out reflections, shadows and distortion, says lead author David Schurig of Duke.

The technology differs from "stealth" applications, which tamp down radar reflections but don't eliminate them. A cloak, in theory, would allow radar waves to flow past an object without any interference whatsoever, Smith says.

To test the cloak, researchers first fired microwaves at a copper cylinder and recorded the electronic shadow it cast. They next showed in contrast that microwaves largely pass around the cloak as if it weren't there. "There is some reflection, so this isn't perfect, but it is only a prototype," Schurig says.

It could be years before theorists figure out how to cloak visible light, a much more difficult task. Still, "it is the proof of principle that this technology is feasible, and so it is very likely to inspire a wave of new research," says physicist Ulf Leonhardt of Scotland's University of St. Andrews, who was not on the prototype team.

The next big step is to develop "broadband invisibility" able to cancel out more than narrow wavelengths, he says.

The theory behind the invisibility cloak device is only 5 months old. It was unveiled in *Science* in May by study co-author John Pendry of Imperial College London and Leonhardt in separate papers.

And there's one drawback to a visible-light invisibility cloak, says physicist Greg Gbur of the University of North Carolina-Charlotte: "People won't see you, but you also won't see them, so it's not the same as Harry Potter's cloak."

Posted 10/19/2006 9:51 AM ET

Updated 10/20/2006 8:20 AM ET E-mail | Save | Print | Reprints & Permissions | Subscribe to stories like this RSS