

**Pesco's journal:**

## **Beamed bandwidth**

Currently, optical wireless systems (known as ["free space optics"](#)) use lasers to transmit data from point-to-point. The bad news about sending data over line-of-sight laser beams is that the transmissions are easily blocked by clouds, fog, or bad weather.

Researchers at Pennsylvania State University have devised new technology to pack the data into rapid-fire bursts of **light that can blast through fog and clouds**. This new system uses ultra-short pulses of laser light that provide greater bandwidth and improved reliability over conventional optical wireless links. The approach uses a technique called "fractal modulation," borrowed from mathematics, to produce wavelets that are less likely to interact with rain or fog and can co-exist in a signal channel without interference.

"By sending the same message at several different rates, one of them can probably get through," [says](#) project lead Mohsen Kavehrad, director of the university's Center for Information and Communications Technology Research.

According to the researchers, who presented their work at a scientific conference last week, "the new approach could help bring optical bandwidth, capable of carrying huge amounts of information, to applications ranging from wireless communication between air and ground vehicles on the battlefield to short links between college campus buildings to metropolitan area networks that connect all the buildings in a city."

Perhaps in a decade or so, this system will enable optical communications to become part of a reliable broadband infrastructure integrating various fixed and mobile wireless technologies.

Nov 08 2004 0 comments

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