

RoF technology holds promise for wireless and wireline on a single platform

October 16 2012



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EU-funded scientists experimentally and theoretically validated technology for the future convergence of wireless and wireline communications into a common infrastructure.

The information revolution demands continuously increasing speed and reliability with virtually limitless access. The next step in the evolutionary process is a convergence of wireless and wireline transmission into a common infrastructure.

Phase-modulated radio-over-fibre (RoF) technology is an important candidate for implementing multi-channel (via so-called wavelength-division multiplexing, or WDM) wireless-wireline access networks.

RoF integrates fibre optic networks with wireless ones. [Radio signals](#) are transported from a radio base station to a remote antenna via [optical fibres](#) and then radiated through the air via end users' mobile stations.

[Radio waves](#) are part of the [electromagnetic spectrum](#) that consists of all possible [wavelengths of light](#) in the form of photons. The photons travel in waves defined by peaks and troughs, much as water rippling out from a stone thrown in a pond.

The distance from one peak to another (or one trough to another) is the wavelength. The distance from centre to peak is the amplitude which is related to the intensity of the light. The phase of a signal is the position of the wave at a certain time relative to a reference – imagine ripples spreading out in a pond passing by a stationary object such as a reed.

Modulating data to be transmitted based on the phase of the carrier signal (phase modulation) has important benefits compared to conventional intensity modulation.

[European researchers](#) set out to experimentally and theoretically evaluate the performance of multi-channel phase-modulated RoF optical links in transmission of wireless-wireline signals.

With EU funding of the 'WDM [optical phase](#)-modulated radio-over-fiber systems' (Woprof) project, investigators did so, comparing performance to that of conventional intensity-modulated RoF links. They created a phase-modulated RoF link and conducted convergence experiments with broadband wireline services and high-speed wireless signals.

Finally, the team also identified a new wireless technology for short-range in-home applications that has been met with great enthusiasm worldwide.

Woprof results have advanced the communications sector toward convergence of wireless and wireline systems into a common infrastructure. Along the way, the Woprof team may have come up with tomorrow's fastest technology to transfer videos and pictures from a cell phone to a PC.

Provided by CORDIS

Citation: RoF technology holds promise for wireless and wireline on a single platform (2012, October 16) retrieved 20 March 2024 from <https://phys.org/news/2012-10-rof-technology-wireless-wireline-platform.html>

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