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NETWORK DIGEST

Tailoring 100G for Metro Networks

by Stephan Rettenberger



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Karlsruhe Institute Achieves 26 Tbps Single-Line Rate

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Karlsruhe Institute of Technology (KIT) reported a new transmission record over fiber -- 26 Terabits per second (Tbps) on a single laser beam over a distance of 50 km. The experiment transferred the equivalent of 700 DVDs in one second. The rate significantly exceeds the current 100 Gbps, 400 Gbps and 1 Tbps channel rates that are commercially available or even under discussion.

The researchers attributed the record channel rate performance to a new opto-electric decoding method that starts with purely optical calculations at the highest data rates and then breaks down the high data rate to smaller bit rates that can then be processed electrically. The initial optical reduction of the bit rates is required, as no electronic processing methods are available for a data rate of 26 terabits per second. Orthogonal frequency division multiplexing (OFDM) was applied. The key innovation was an optical implementation of the mathematical routine. This optical fast Fourier transformation scheme proved to be highly-efficient.



26 Tbps

"Our result shows that physical limits are not yet exceeded even at extremely high data rates", said Professor Leuthold, who heads the Institutes of Photonics and Quantum Electronics and Microstructure Technology at KIT. "A few years ago, data rates of 26 terabits per second were deemed utopian even for systems with many lasers and there would not have been any applications. With 26 terabits per second, it would have been possible to transmit up to 400 million telephone calls at the same time. Nobody needed this at that time. Today, the situation is different."

Participants in the research include members of the staff of Agilent and Micram Deutschland, Time-Bandwidth Switzerland, Finisar Israel, and the University of Southampton in Great Britain.

The results were reported in the journal "Nature Photonics".

http://www.kit.edu/visit/pi_2011_6977.php

<http://www.nature.com/nphoton/index.html>

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