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Optical OFDM, a hype or is it for real?

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Abstract

In the last two years the number of optical OFDM papers has grown exponentially, but is this modulation format really a viable candidate for next generation fiber-optic transmission systems? In this paper we review the most significant technologies and aim to evaluate the potential of OFDM for 100GbE applications.

Extended Abstract

Optical OFDM is currently a hot topic in the fiber-optic research community and the number of optical OFDM research papers published in international conferences and journals has grown exponentially in the last couple of years. However, is this modulation format really a viable candidate for next generation fiber-optic transmission systems? At current, the questions how the performance scales with other promising modulation formats such as single-carrier QPSK in combination with digital equalization and coherent detection remains to be answered. As well, many different concepts have been introduced in the fiber-optic community, with practically identical concepts often being presented under different names. In this paper, we aim to provide an overview of the most significant optical OFDM research reported so far and try to evaluate the potential of OFDM for next generation 100GbE applications.

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Sander Jansen received his Ph.D. degree (with highest honors) in Electric Engineering from the Eindhoven, University of Technology, The Netherlands. His Ph.D. project focused on improving the reach of long-haul fiber-optic transmission systems through optical phase conjugation (OPC). Since September 2006 he has been working as an associate research engineer at KDDI R&D Laboratories in Saitama, Japan where he specialized in OFDM for fiber-optic transmission systems. He authored and co-authored more than 60 refereed papers and conference contributions. Dr. Jansen was awarded the IEEE LEOS Graduate Student Fellowship in 2005. Recently, he received the "KDDI 2007 Best Patent Award".