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Multi-core and multi-mode optical fibers for high capacity optical transmission

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Abstract

Optical transmission systems and networks underpin the digital economy and form a key part of the worldwide communications infrastructure. However, ongoing provision of new services and larger data volumes required to meet the needs of businesses, academia, governments and citizens provide new challenges to optical communication infrastructure with operators also facing commercial pressure to offer them at ever lower cost per bit. In the research community this has led to the exploration of advanced optical fibers to replace the standard single mode fiber (SMF) which has dominated commercial fiber systems for decades. Broadly described as space-division-multiplexing (SDM) [1] , this research field refers to fibers that allow data transmission in parallel strands of SMF, a combination of multiple cores within a single cladding or multiple modes in a single core [2]. In each case, the aim is typically to both increase the achievable data throughput and also to encourage energy and resource savings, hardware integration and joint signal-processing. Here, we describe a series of experiments that aim to characterize the basic properties of such fibers [3-5] and how they can be used to increase efficiency and cost savings. Finally, we describe experiments demonstrating how they may be exploited for super high capacity optical transmission

Biography:

Ben Puttnam is a senior researcher in the Photonic Network System Laboratory at the National Institute of Information and Communications Technology (NICT) in Tokyo, Japan. He received the MPhys degree in Physics from the University of Manchester (UK) in 2000 and the PhD degree from University College London in 2008. In between he worked as a Switch Design Engineer for T-mobile (UK). After short term visits to NICT, supported by JSPS and the Photonics group at Chalmers University, Göteborg, Sweden supported by the Ericsson research foundation he re-joined NICT in March 2010. His current research interests are applications and sub-systems for SDM transmission and optical signal processing devices

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